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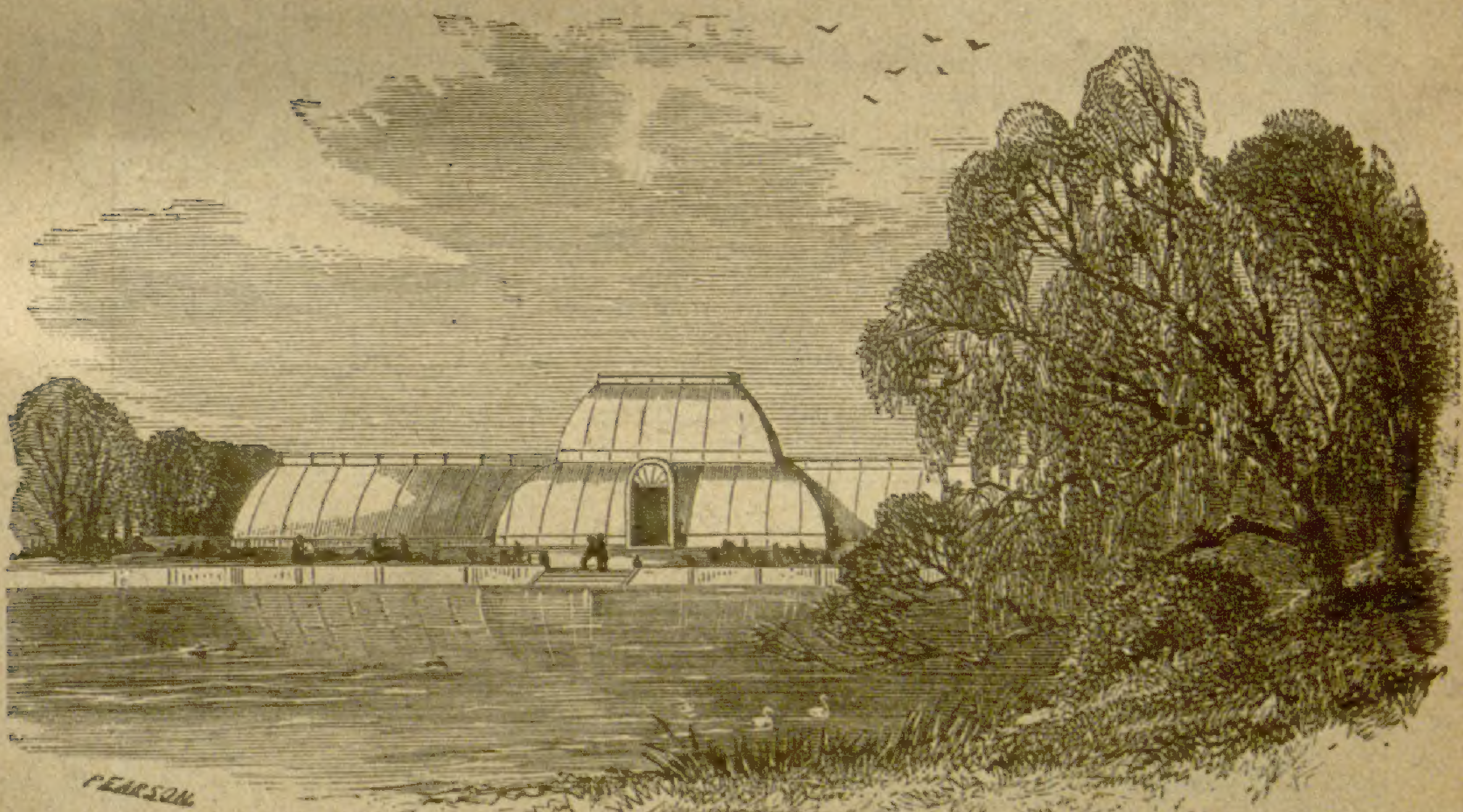

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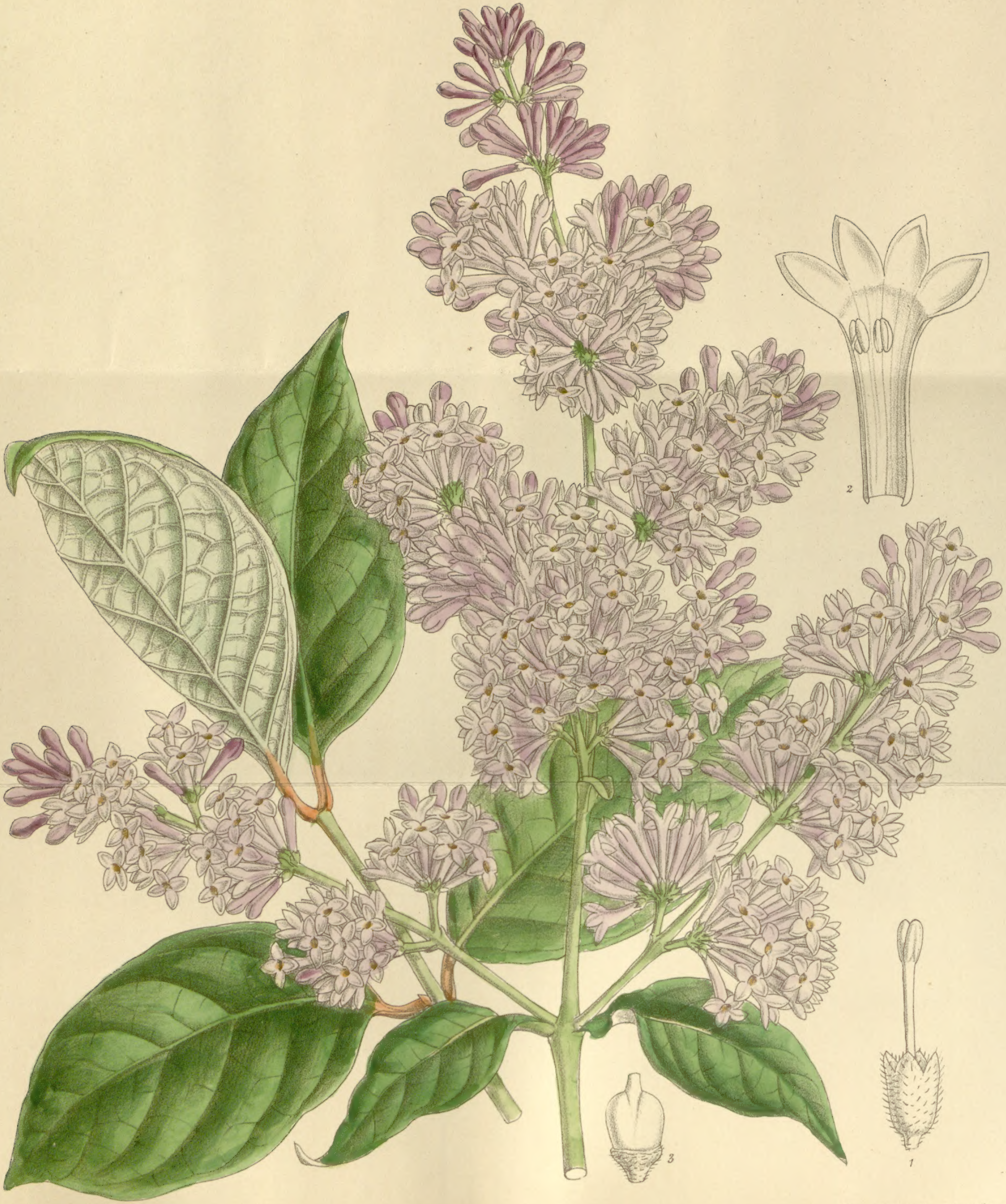

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TAB. 8292.

SYRINGA BRETSCHNEIDERI.

North China.

OLEACEAE. Tribe SYRINGEAE.

SYRINGA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 675.

Syringa Bretschneideri, *Lemoine ex Wien. Illustr. Gart. Zeit.* 1890, p. 369; *Wittmack in Gartenfl.* 1895, p. 499; *Henry in Rev. Hort.* 1902, p. 40; species *S. Josikaeae,* Jacq., affinis, sed foliis subtus pubescentibus, paniculis majoribus densioribus et floribus pallidioribus differt.

Frutex ad 3 m. altus, ramis glabris. *Folia* elliptica vel elliptico-lanceolata, acuta vel acuminata, basi cuneata vel cuneato-rotundata, supra glabra, subtus pallidiora, tenuiter piloso-pubescentia, petiolo 7–15 mm. longo, lamina 6–15 cm. longa, 2·5–6·5 cm. lata. *Panicula* 8–30 cm. longa, 8–16 cm. lata, floribus ad nodos ramorum vel apice ramulorum ultimorum in fasciculos dense confertis. *Pedicelli* 0–2 mm. longi, glabri vel minute puberuli. *Calyx* 2–2·5 mm. longus, campanulatus, breviter et obtuse 4-dentatus, pilis paucis conspersis instructus vel glaber. *Corolla* roseo-lilacina, glabra; tubus 1–1·2 cm. longus; lobi 3–4 mm. longi, ovati, obtusi, patentes. *Capsula* deflexa, 1–1·4 cm. longa, 4 mm. crassa, oblongo-lanceolata, obtusa, glabra.—*S. Emodi,* var. *rosea,* Cornu in Rev. Hort. 1888, p. 492, c. icon.; Wittmack in Gartenfl., 1895, p. 499, fig. 100. *S. villosa,* Sargent in Gard. & For. 1888, p. 222, nec Vahl.—N. E. BROWN.

The Lilac here figured was introduced to European gardens from Northern China, whence seeds reached Paris somewhere between 1879 and 1883. The examples in the Kew collection have been received from various sources and under the diverse names *S. Emodi*, var. *rosea*, *S. villosa*, *S. Josikaea*, var. *eximia*, and *S. Bretschneideri*. In 1888 it was in France treated as a variety of *S. Emodi*, Wall.; that species, however, differs from the subject of our plate in having quite glabrous leaves which are much paler beneath, with a different main-venation and a less distinct secondary reticulation; the panicles too are smaller and the flowers are white. In the same year our plant was elsewhere referred to *S. villosa,* Vahl; Vahl's plant is, however, a very distinct species with smaller and rounder leaves, less copious panicles and smaller flowers of a paler colour. The species now described is more nearly allied to *S. Josikaea,* Jacq., of which it has by some growers been considered a variety, than to either of the species just mentioned; *S. Josikaea*, however, has glabrous leaves, much whiter beneath, and has more deeply coloured flowers than our plant, which appears amply entitled to the separate recognition first accorded to it by Mr. Lemoine in 1900. Like all Lilacs, *S. Bretschneideri* is fond of abundant moisture and generous treatment at the root; it thrives well in a rich loamy soil. The finest example in the collection at Kew is now a handsome bush 10 ft. high and as much through, but it promises to become considerably taller. Its fine panicles —18 in. high and 12 in. across—are at their best in early June when those of the common Lilac and its varieties have faded. This feature adds greatly to the value of *S. Bretschneideri* in the garden, and entitles it to a foremost place among hardy flowering shrubs. It can be increased by means of cuttings and also by seeds.

DESCRIPTION.—*Shrub*, 10 ft. high or higher; branches glabrous. *Leaves* elliptic or elliptic-lanceolate, acute or acuminate, base cuneate or almost rounded, glabrous above, beneath paler and thinly pubescent, 2½–6 in. long, 1–2½ in. wide, petiole 2¾–6 in. long. *Panicle* 3–12 in. long, 3–6 in. wide, flowers densely clustered at the nodes or at the tips of terminal branchlets. *Pedicels* 0–1 lin. long, glabrous or finely puberulous. *Calyx* 1–1¼ lin. long, campanulate, shortly and bluntly 4-toothed, glabrous or beset with a few scattered hairs. *Corolla* lilac-rose, glabrous; tubes 5–6 lin. long, lobes 1½–2 lin. long, ovate, obtuse, spreading. *Capsule* deflexed, 5–7 lin. long, 2 lin. wide, oblong-lanceolate, obtuse, glabrous.

Fig. 1, flower with corolla removed; 2, corolla laid open; 3, ovary, the style removed:—*all enlarged.*

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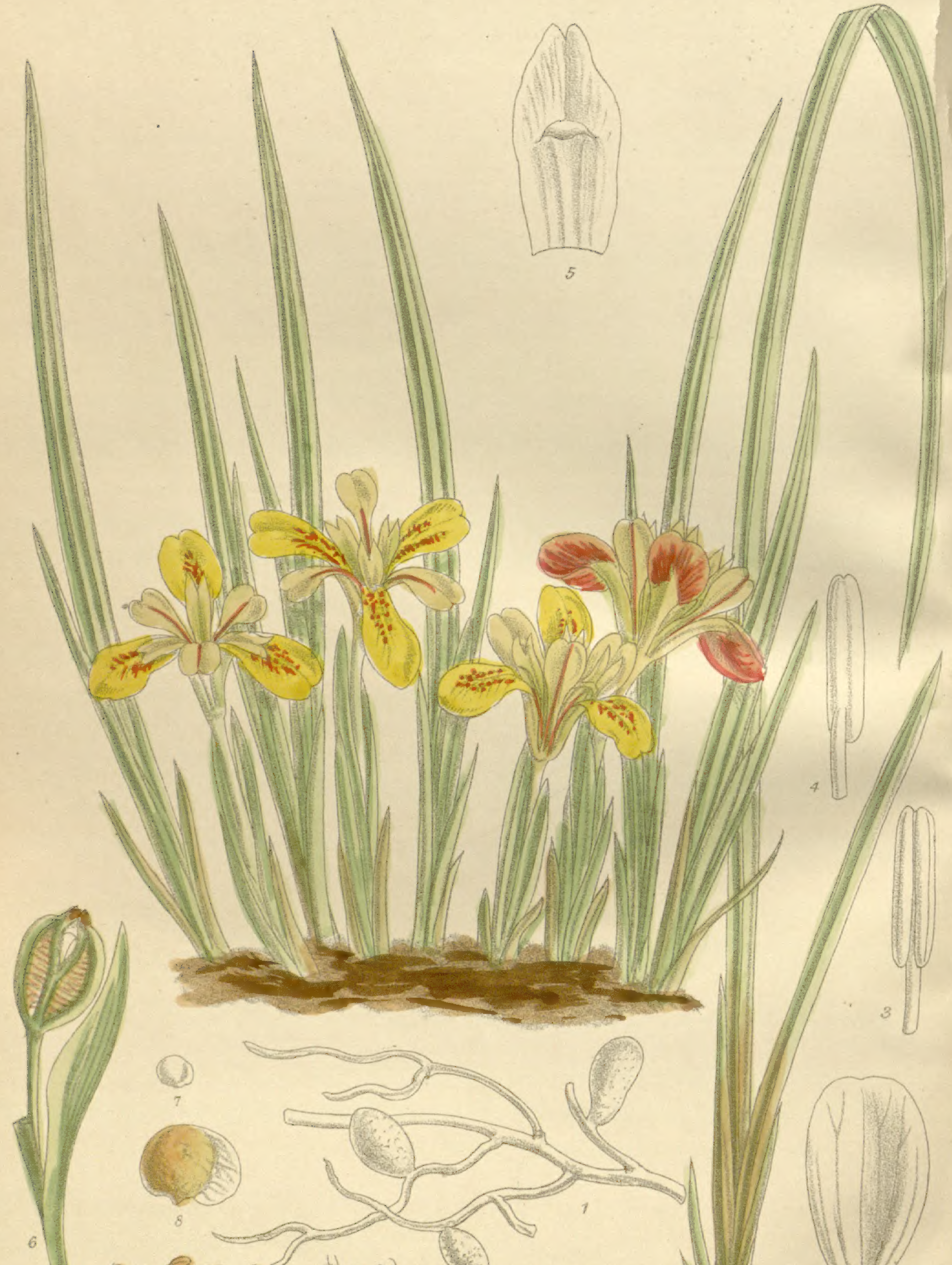

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TAB. 8293.

IRIS MINUTA.

Japan.

IRIDACEAE. Tribe IRIDEAE.

IRIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris minuta, *Franch. et Sav. Enum. Pl. Jap.* vol. ii. pp. 42 (excl. syn.), 521; *Maxim. in Mel. Biol.* pars x. p. 715; *Baker, Handb. Irid.* p. 2; *Makino in Tokyo Bot. Mag.* vol. xvi. p. 149; *I. ruthenicae*, var. *nanae*, Maxim., affinis sed floribus minoribus luteis, tubo perigonii gracili multo longiore, laciniarum interiorum forma et magnitudine distincta.

Herba humilis, dense caespitosa, rhizomate repente tenui radices copiosissimas tuberculiferas edente, innovationibus aliis florigeris, aliis folia tantum proferentibus. *Folia* innovationum sterilium circiter 4, infima brevia, vaginantia, demum in fibras soluta, caetera anguste ensiformia, summum sub anthesi flores vix duplo superans, demum ad 45 cm. longum et 2–8 mm. latum, acutum, 5–7-nerve; folia innovationum fertilium omnia brevia, vaginantia. *Scapus* gracilis, brevis. *Spatha* 2-valvis, uniflora; valvae oblanceolatae, angustae, acutae, versus margines scariosae, viridescentes, 3–3·5 cm. longae. *Pedicellus* gracillimus, ad 2 vel ultra 2 cm. longus. *Perigonium* luteum, 2·5–3 cm. diametro; tubus gracilis, circiter 2 cm. longus; laciniae exteriores ebarbatae, ungue erecto-patente quam limbo longiore intus luteo extra luteo-viridi, limbo patulo vel paulo deflexo obovato ad 10 mm. longo et 8 mm. lato luteo secundum costam fusco-purpureo-maculato; laciniae interiores erectae, quam exteriores breviores, styli crestas paulo excedentes, ungue purpurascente angusto, limbo obovato retuso flavo. *Antherae* 4 mm. longae. *Styli* rami pallide flavi cum cristis 10 mm. (vel paulo ultra) longi, cristae lobis anguste ovato-lanceolatis subacutis. *Ovarium* oblongo-cylindricum, obtuse trigonum, 8–10 mm. longum. *Capsula* subglobosa, 15 mm. longa, tricostata. *Semina* subglobosa, flava, 4 mm. diametro, appendice majusculo albido.—O. STAPF.

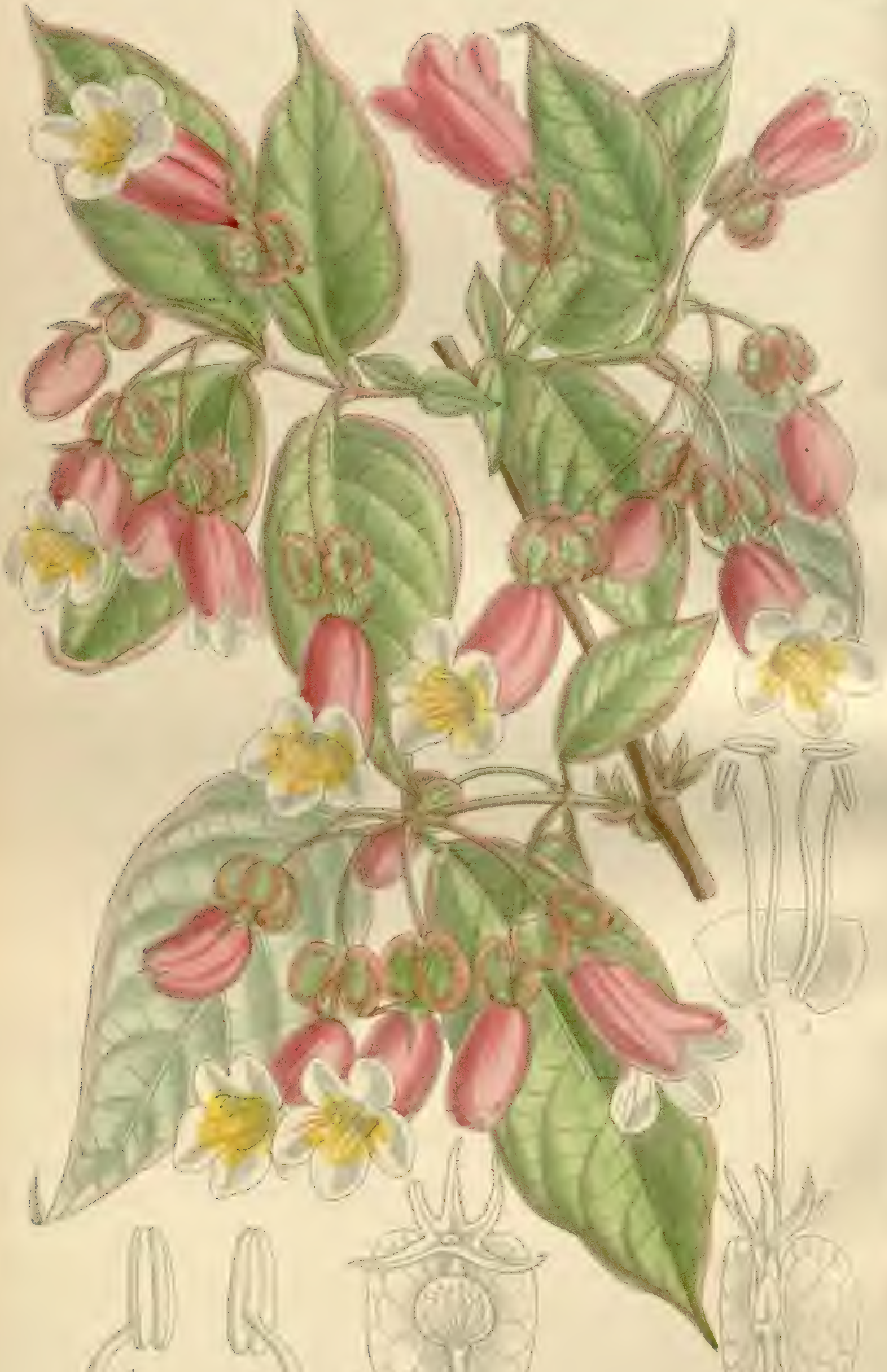
The plant from which the drawing now given has been prepared was obtained for the Kew collection by purchase from the Yokohama Nursery Company in February, 1908; a few days after its arrival a flowering example of the same species was presented to the herbarium at Kew by Mr. W. E. Ledger, who had grown it in his garden at Wimbledon. The species, which is described in the Yokohama catalogue as "a lovely tiny Iris, 4 or 5 inches high, with yellow flowers," is only known in a cultivated state. It is generally assumed to be the plant described by Franchet

and Savatier as *I. minuta*, though it has to be observed that these authors describe the flowers as pale blue with purple veins, and identify with their species an Iris figured in the Honzo Zufu (vol. xxiii. fol. recto, fig. 1 recto, fig. sinistr.), which is altogether a different plant. On the other hand, the late Mr. Maximowicz has given, under *I. minuta*, an account of a coloured drawing by Siebold of a Japanese Iris which agrees very well with the plant now figured, and there is no doubt that our plant is a species to which the exhaustive description of *I. minuta* by Mr. Makino applies. At Kew, *I. minuta* has been cultivated in a pot in a cold frame, where it has formed grassy evergreen tufts, with thin, wiry, freely branching and interlacing rhizomes that emit numerous very thin roots. These roots, when examined late in the season, are found to bear many very small potato-like tubers, in shape and size somewhat resembling the eggs of ants; these tubers may serve the purpose of the large fleshy tubers met with on the roots of certain species of *Asparagus* and referred to at plate 8288 of this work. While not a showy species, *I. minuta* deserves to be included in cultivated Iris collections; it is evidently easily kept in health, and promises to prove fairly hardy. It flowers freely in May.

DESCRIPTION.—*Herb*, dwarf and densely tufted; rootstock creeping and branching, with numerous slender roots at length beset with many small tubers; shoots some flowering, others bearing only leaves. *Leaves* of the sterile shoots about 4, the lowest short and sheathing, at length splitting into fibrils, the others narrow ensiform, the uppermost barely twice as long as the flowering shoots, 18 in. long, 1–4 lin. wide, acute, 5–7-nerved; those of the flowering shoots all short and sheathing. *Scape* slender, short; spathe 2-valved, 1-flowered; valves oblanceolate, narrow, acute, with scarious margins, greenish, 1¼–1½ in. long; pedicel slender, ¾–1 in. long. *Perianth* yellow, 1–1¼ in. across; tube slender, about ¾ in. long; outer lobes unbearded, claw erecto-patent longer than the limb, yellow within, greenish yellow externally, limb spreading or somewhat deflexed, obovate, about 5 lin. long, 4 lin. wide, yellow and flecked with purple along the mid-rib; inner lobes erect, shorter than the outer, rather longer than the style-crests, claw narrow, purplish, limb obovate, retuse, yellow. *Anthers* 2 lin. long. *Style-arms* pale yellow with crests 5–6 lin. long, lobes of the crests narrowly ovate-lanceolate, subacute. *Ovary* oblong-cylindric, bluntly trigonous, 4–5 lin. long. *Capsule* subglobose, about $\frac{2}{3}$ in. long, 3-costate. *Seeds* subglobose, yellow, 2 lin. wide, with a rather large whitish appendage.

Fig. 1, part of a root showing small tubers; 2, standard; 3 and 4, stamens; 5, stigma; 6, fruit; 7 and 8, seed:—*all except* 6 *and* 7 *enlarged.*

8294



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TAB. 8294.

DIPELTA VENTRICOSA.

Western China.

CAPRIFOLIACEAE. Tribe LONICEREAE.

DIPELTA, *Maxim. in Bull. Acad. Pétersb.* vol. xxiv. p. 50; *Engl. & Prantl. Natürlich. Pflanzenfam.* vol. iv. 4, p. 165.

Dipelta ventricosa, *Hemsl. in Gard. Chron.* 1908, vol. xliv. p. 101; a specibus adhuc descriptis corolla usque ad basin late ventricoso-inflata differt.

Frutex 2-5 m. altus, ramulis florigeris novellis pubescentibus mox glabris; internodii circiter 5 cm. longi. *Folia* opposita, lanceolata vel ovato-lanceolata, longe caudato-acuminata, basi rotundata vel raro subacuta, 5-15 cm. longa, 2-4·5 cm. lata, membranacea vel demum subcoriacea, margine remote glanduloso-denticulata, ciliolata, supra parce strigillosa, subtus nervis parce pilosula, nervis lateralibus utrinque 6-7 supra inconspicuis; petioli graciles vix ad 1 cm. usque longi, glanduloso-pilosi. *Pedunculi* axillares, gracillimi, breves, 1-pluriflori; pedicelli 1-1·5 cm. longi, parce glanduloso-pubescentes: bracteae filiformes, 1-2 mm. longae, pilosae; bracteolae 6; 2 minimae infra pedicelli medium positae; 4 amplae, persistentes, juxta ovarii basin enatae, 2 exteriores ovatae, minores, 2 interiores auriculiformes, ad 1·5 cm. usque longae. *Calycis* segmenta lineari-lanceolata, acutissima, 5-8 mm. longa, ciliolata. *Corolla* tubulosa, bilabiata, circiter 3 cm. longa, extra rubro-purpurea, intus albo aurantiaca; tubus latus ad basin usque ventricoso-inflatus, antice basi leviter gibbosus, lobis 5 rotundatis leviter recurvis. *Stamina* 4, didynama, postica e fauce brevissime exserta, filamentis filiformibus glabris. *Ovarium* 4-loculare, glanduliferum; stylus filiformis, integer, glaber. *Fructus* calycis segmentis coronatus, bracteolis accrescentibus appressis reticulatis absconditus, cum bracteolis circiter 2 cm. diametro.—J. HUTCHINSON.

The genus *Dipelta*, founded by Maximowicz in 1877, differs from *Diervilla* (*Weigelia*), to which it is most closely allied, by the presence of the striking bracteoles at the base of the ovary which grow out to form dry membranous wings to the fruit. The species which forms the subject of our plate differs from every other in the genus in having the corolla widely inflated to the base; it appears, however, to be most nearly allied to *D. yunnanensis*, Franch., which differs in having entire leaves as well as in having the tube of the corolla contracted at the base. Like *D. yunnanensis*, the species now figured is a native of Western China, where both species have been found by Mr. E. H. Wilson, growing at an altitude of 8,500 ft. above sea-level. The material on which the present figure and description have been based was supplied by Messrs. J. Veitch & Sons, in whose nursery at Coombe Wood it forms a handsome shrub which thrives excellently in the good loam characteristic of the locality. Judging from its behaviour there, *D. ventricosa* promises to be a satisfactory garden plant; it is quite hardy, its cultivation presents no difficulties, and it is easily propagated by cuttings.

DESCRIPTION.—*Shrub*, 7–18 ft. in height, young flowering shoots at first pubescent, soon glabrous; internodes about 2 in. long. *Leaves* opposite, lanceolate or ovate-lanceolate, caudate-acuminate, base rounded or rarely slightly cuneate, 2–6 in. long, 1¾–2¾ in. wide, membranous or at length subcoriaceous, margin distantly gland-toothed, ciliolate, sparingly strigose above, sparsely pubescent on the nerves beneath; lateral nerves 6–7 on each side hardly visible above; petioles slender, 4–5 lin. long, glandular hairy. *Peduncles* axillary, slender, short, 1–more-flowered; pedicels 5–8 lin. long, sparingly glandular pubescent; bracts filiform, 1 lin. long or less, hairy; bracteoles 6; 2 very small below the middle of each pedicel, 4 large near the base of the ovary, of these the outer pair smaller ovate, the inner pair auriculate up to 8 lin. long. *Calyx-lobes* linear-lanceolate, very acute, 3–4 lin. long, ciliolate. *Corolla* tubular, 2-lipped, about 1¼ in. long, outside red, within whitish orange; tube wide ventricose to the base, slightly gibbous below in front; lobes 5, rounded, slightly recurved. *Stamens* 4, didynamous, the upper pair somewhat exserted; filaments filiform, glabrous. *Ovary* 4-celled, glandular; style filiform, entire, glabrous. *Fruit* crowned by the persistent calyx-lobes, and hidden by the adpressed reticulate accrescent bracteoles, ¾ in. wide, including the bracteoles.

Fig. 1, upper pair of bracteoles, calyx and pistil, seen from behind; 2, bracteoles and calyx, front view; 3, base of corolla tube, laid open, showing the stamens; 4 and 5, anthers :—*all enlarged.*

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TAB. 8295.

OURISIA MACROPHYLLA.

New Zealand.

SCROPHULARIACEAE. Tribe DIGITALEAE.

OURISIA, *Commers.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 962.

Ourisia macrophylla, *Hook. Ic. Pl.* vol. vi. tt. 545-546; *Hook. f. Flor. New Zeal.* vol. i. p. 197, et *Handb. New Zeal. Fl.* p. 218; *Cheeseman, Man. New Zeal. Fl.* p. 549; species *O. macrocarpae*, Hook. f., affinis, sed scapo pedicellisque pubescentibus facile distinguenda.

Herba perennis. *Folia* radicalia; petiolus 2·5–10 cm. longus, supra leviter concavus, dorso rotundatus, pubescens, marginibus ciliatis purpureotinctus; lamina 3–8·5 cm. longa, 2–7·5 cm. lata, ovata vel elliptico-ovata, obtusa, basi subcordata vel rotundata, crenato-dentata, utrinque glabra, laete virens, venis valde impressis. *Scapus* 7·5–30 cm. longus, interdum foliorum sessilium lanceolatorum vel ellipticorum pari instructus, pubescens. *Flores* verticillis 1–4 dispositi. *Verticilli* 3–8-flori, 4–8-bracteati. *Bracteae* 1–2 cm. longae, 4–12 mm. latae, sessiles, lineari- ad ovato-lanceolatae, acutae vel obtusae, plus minusve dentatae, glabrae, ciliatae. *Pedicelli* 2–5 cm. longi, pubescentes. *Calyx* 7–10 mm. longus, fere ad basin 5-lobus et prope basin leviter constrictus; lobi oblongo-lanceolati, apice obtusi vel acuti et glandulo minuto instructi, tenuiter pubescentes, minute ciliati. *Corolla* 2–2·2 cm. diam., alba; tubus calyce vix longior, fauce luteobarbatus; limbus obliquus, planus, 5-lobus; lobi late obovati, apice emarginati, duobus superioribus minoribus. *Stamina* subexserta, glabra, alba; staminodium brevissimum filiforme. *Ovarium* ovoideum, glabrum stylus exsertus, glaber.—N. E. BROWN.

There are at least nine species of *Ourisia* natives of New Zealand, and all of them are worthy of a place in our gardens. But though some of them have been known to science for over half a century, the species here figured appears to be the first that has been introduced to cultivation. It is certainly one of the finest in the genus, but it can hardly claim to excel, from the horticultural standpoint, *O. macrocarpa*, Hook. f., which differs in being more robust, with glabrous scapes and pedicels and larger sepals and fruit; or *O. robusta*, Col., also more robust, with pubescent scapes and pedicels, with more numerous whorls of flowers and more flowers in each whorl, but with rather smaller corollas. It would appear indeed that *O. robusta* is at times mistaken for *O. macrophylla*, since the plant figured as *O. macrophylla*, both in Harris, New Zealand Flowers, t. 8, and in Illustrations of the New Zealand Flora, t. 11, appears to be really *O. robusta*. The example from which the figure now given has been prepared was obtained in 1907 from Messrs. Bees, Limited. Grown in a pan of loamy soil and kept under glass all winter, it flowered in a cold frame in April; it may prove hardy in the warmer parts of the United Kingdom. The flowers last for a month or more, and are succeeded by seeds which on being sown germinate in a fortnight and afford a ready means of increase.

DESCRIPTION.—*Herb*, perennial. *Leaves* radical; petiole tinged with purple, 1–4 in. long, somewhat concave above, rounded on the back, pubescent, the margins ciliate; blade 1¼–3½ in. long, ¾–3 in. wide, ovate or elliptic-ovate, obtuse, base subcordate or rounded, margin crenately toothed, glabrous on both sides, bright green, the veins sunk above. *Scape* 3–12 in. long, at times with a pair of sessile lanceolate or elliptic leaves, pubescent. *Flowers* in 1–4 whorls, each whorl 3–8-flowered with 4–8 sessile, linear- to ovate-lanceolate, acute or obtuse, more or less toothed, glabrous, ciliate bracts 5–10 lin. long, 2–6 lin. wide; pedicels ¾–2 in. long, pubescent. *Calyx* 3–5 lin. long, divided almost to the slightly constricted base into 5 oblong-lanceolate lobes, obtuse or acute with a minute apical gland, thinly pubescent and finely ciliate. *Corolla* 10–11 lin. across, white; tube hardly longer than the calyx; throat beset with yellow hairs; limb oblique, flat, 5-lobed, the lobes wide obovate, emarginate, the two upper smaller than the others. *Stamens* slightly exserted, glabrous, white; staminode very short, filiform. *Ovary* ovoid, glabrous; style glabrous, exserted.

Fig. 1, calyx and pistil; 2, corolla laid open, showing stamens and staminode 3 and 4, stamens; 5, ovary:—*all enlarged.*

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M.S. del. J.N.Fitch lith.

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TAB. 8296.

ERIA RHODOPTERA.

Philippines.

ORCHIDACEAE. Tribe EPIDENDREAE.

ERIA, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 509.

Eria rhodoptera, *Reichb. f. in Gard. Chron.* 1882, xviii. p. 586; *Rolfe in Orch. Rev.* 1909, p. 220: ad *E. Dillwynii*, Hook., accedit, sed petalis et labelli lobis lateralibus sanguineis differt.

Pseudobulbi aggregati, ovoideo-oblongi, 3-10 cm. longi, 2-4-phylli. *Folia* coriacea, oblongo-lanceolata, subacuta, 12-25 cm. longa, 2-3 cm. lata. *Scapi* erecti, 14-17 cm. longi, parce pubescentes; racemi multiflori. *Bracteae* oblongae, subobtusae, membranaceae, 1-1·8 cm. longae, stramineae. *Pedicelli* graciles, 1·3-2 cm. longi. *Flores* mediocres, numerosi, straminei, petalis et labelli lobis lateralibus sanguineis. *Sepala* oblonga, subacuta, apice recurva, 1–1·3 cm. longa. *Petala* oblonga, subacuta, apice oblique incurva, 1–1·3 cm. longa. *Labellum* trilobum, 6–8 mm. longum; lobi laterales erecti rotundati, obtusi; lobus intermedius recurvus, obovatus, apiculatus; discus tricarinatus, carinis apice crenatis vel subfimbriatis. *Columna* clavata, 4 mm. longa.—*E. Laucheana*, Kränzl. in Gard. Chron. 1892, vol. xi. p. 809.—R. A. ROLFE.

Eria rhodoptera was described by the late Professor Reichenbach from a plant which flowered in the Pine-apple nursery of Messrs. Henderson & Son, at Maida Vale, in 1882. The plant, which was described as having flowers of a pallid whitish or ochre colour, with purple petals and purple side-lobes to the lip, appears to have been soon lost sight of, and its native country was unknown. Ten years later Professor Kränzlin described as *E. Laucheana* a plant, of which the native country was also unknown, from the collection of Prince Leichtenstein at Eisgrab. A plant of *E. Laucheana* was sent to Kew in 1904 from the Botanical Garden at Heidelberg, where there is a good and well-grown collection of Orchids. This plant flowered at Kew in April in a tropical house under the treatment suitable for species of *Eria*, *Dendrobium* and *Coelogyne*, and on flowering it was found to be identical with herbarium material of a species of *Eria* from the Philippines and also

JANUARY, 1910.

to be the same as the earlier described *E. rhodoptera*. The species comes nearest to *E. Dillwynii*, of the section Hymeneria, figured at t. 4163 of this work, but is one of the most distinct in this section on account of its crimson petals and lip.

DESCRIPTION. — *Herb*; pseudobulbs clustered, ovoid-oblong, 2¼–4 in. long, 2–4-leaved. *Leaves* coriaceous, oblong-lanceolate, subacute, 4½–10 in. long, ¾–1¼ in. wide. *Scapes* erect, 5½–7 in. long, sparingly pubescent; racemes many-flowered; bracts oblong, subobtuse, membranous, 5–9 lin. long, pale straw-coloured or whitish. *Flowers* medium, many, pale straw-coloured or whitish, with crimson petals and side-lobes of lip; pedicels slender, 6–10 in. long. *Sepals* oblong, subacute, recurved at the tip, 5–6 lin. long. *Petals* oblong, subacute, obliquely incurved at the tip, 5–6 lin. long. *Lip* 3-lobed, 3–4 lin. long; lateral lobes erect, rounded, obtuse; mid-lobe recurved, obovate, apiculate; disk 3-keeled, the keels crenate or somewhat fimbriate at the tip. *Column* clavate, 2 lin. long.

Fig. 1, lip and column; 2, column, front view; 3, pollinia:—*all enlarged.*

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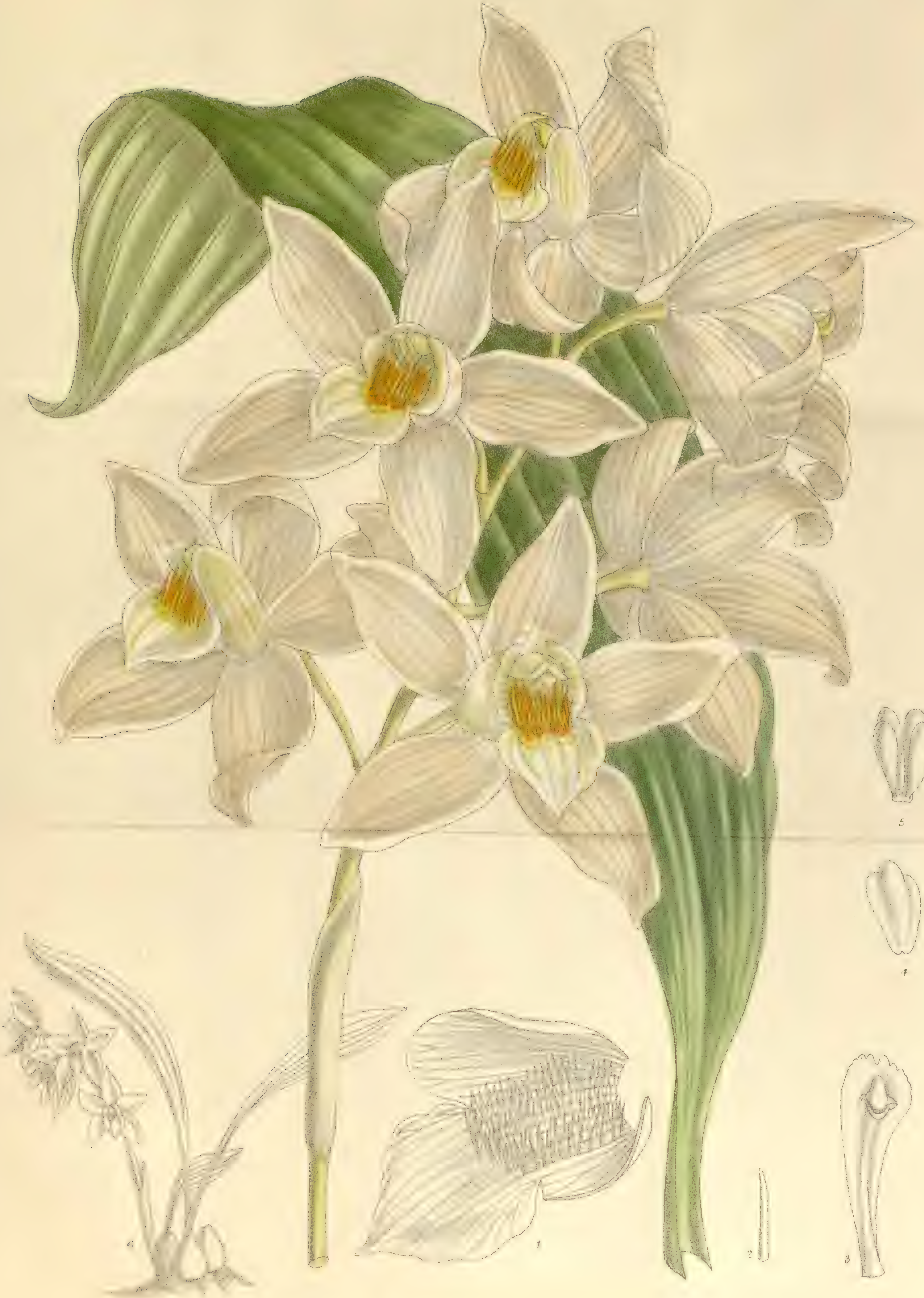

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Tab. 8297.

COELOGYNE Mooreana.

Annam.

Orchidaceae. Tribe Epidendreae.

Coelogyne, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 518; *Pfitzer in Engl. Pflanzenreich, Coelogyninae,* p. 20.

Coelogyne Mooreana, *Sander ex Rolfe in Kew Bull.* 1907, p. 129; *Gard. Chron.* 1906, vol. xl. p. 414; *Rolfe in Orch. Rev.* 1907, p. 23; 1908, p. 329, fig. 42; affinis *C. cristatae*, Lindl., pseudobulbis aggregatis, foliis longioribus, scapis altioribus, bracteis deciduis et floribus minoribus differt.

Herba. *Pseudobulbi* aggregati, ovoideo-oblongi, obtuse tetragoni, canaliculati, circa 7 cm. longi, apice angusti, diphylli. *Folia* elongato-lanceolata, acuta, 7-nervia, basi in petiolum attenuata, 24–50 cm. longa, 3–5 cm. lata, arcuata. *Scapi* erecti, 30–40 cm. alti; racemi 4–8-flori. *Bracteae* deciduae. *Pedicelli* 2·5–3·5 cm. longi. *Flores* speciosi, albi, labelli disco aureo-maculato et pilis subclavatis flavis instructo. *Sepala* elliptico-oblonga, acuta, leviter carinata, 4·5–5 cm. longa. *Petala* elliptica, acuta 4–5·5 cm. longa. *Labellum* trilobum, 3–3·5 cm. longum, basi concavo-saccatum; lobi laterales oblongi, obtusi, incurvi et columnam involventes; lobus intermedius ovatus, obtusus; discus crebre piloso-papillosus, pilis gracilibus 3–4 mm. longis et apice subclavatis. *Columna* gracilis, late alata, circa 2·5 cm. longa.—R. A. Rolfe.

This handsome *Coelogyne* was introduced from Annam by Messrs. Sander & Sons, St. Albans, through their collector, Mr. Micholitz, who found it growing at an elevation of 4,500 ft. above sea level on the Laos aspect of the Lang Bian range. It flowered first, in December, 1906, at St. Albans and simultaneously at the Royal Botanic Garden, Glasnevin. Another plant presented to the Kew collection by Messrs. Sander has not yet flowered, though it has thriven well under the cultural conditions suitable for *C. cristata*, Lindl., to which it is more nearly allied than to any other known form. The material on which the original description was based, and that employed in preparing the plate now given, has been supplied from the Glasnevin plant by Mr. F. W. Moore, after whom the species has been named. The largest flower-spike so far produced in cultivation has borne eight flowers. These in structure and as regards the appendages of the lip are very like the flowers

February, 1910.

of *C. cristata*, but are firmer in texture and remain longer fresh. In habit, however, *C. Mooreana* differs a good deal from *C. cristata*, and is much more like the Malayan *C. Sanderiana*, Reichb. f. The species is likely to become popular in Orchid collections.

DESCRIPTION.—*Herb*; pseudobulbs clustered, ovoid-oblong, obtusely 4-angled and channelled, about 3 in. long, narrowed towards the tip, 2-leaved. *Leaves* long lanceolate, acute, 7-nerved, narrowed below into a petiole; 10–20 in. long, 1¼–2 in. wide, arcuate. *Scapes* erect, 12–16 in. long; racemes 4–8-flowered; bracts deciduous; pedicels 1–1½ in. long. *Flowers* handsome, white, the disk of the lip with a golden yellow blotch and beset with yellow subclavate processes. *Sepals* elliptic-oblong, acute, faintly keeled, 1¾–2 in. long. *Petals* elliptic, acute, 1¾–2 in. long. *Lip* 3-lobed, 1¼–1½ in. long, base concave, pouched; lateral lobes oblong, incurved and embracing the column; mid-lobe ovate, obtuse; disk closely beset with slender processes about 2 lin. long, clavate at the tip. *Column* slender, widely winged, about 1 in. long.

Fig. 1, lip; 2, one of the lip papillae; 3, column; 4, anther-cap; 5, pollinia: 6, whole plant, showing habit:—1–5 *enlarged*, 6 *much reduced*.

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M.S.del. J.N.Fitch lith.

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TAB. 8298.

POPULUS NIGRA, var. BETULIFOLIA.

Origin uncertain.

SALICACEAE.

POPULUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 412.

Populus nigra, *Linn.*, var. betulifolia, *Torrey. Fl. New York*, vol. ii. p. 216; a forma typica petiolis et ramulis junioribus pubescentibus differt.

Arbor, 9–25 m. alta; truncus rugosissimus, 0·5–1 m. (rarissime ad 1·75 m.) diametro, comam magnam ovoideam ferens; ramuli juniores plus minusve pubescentes, flavi, vetusti cinerascentes, gemmis pallide brunneis. *Folia* deltoideo-rhomboidea, 6–10 cm. longa, 5–8 cm. lata, apice longe attenuato-acuminata, basi late cuneato-rotundata, rarius truncata vel levissime cordata, serrulata, saepe primo pubescentia cito glabrescentia, supra saturate viridia, infra paulum pallidiora; petioli ad 6 cm. longi, primo pubescentes. *Amenta mascula* 2·5–5 cm. longa. *Squamae* late obovatae, circiter 4 mm. longae, laciniis 1·75 mm. longis instructae. *Antherae* saepe 11–17. *Amenta feminea* gracilia, 7–10 cm. longa. *Pedicelli* 2–3 mm. longi. *Capsulae* ovoideae, 5–7 mm. longae.—*P. nigra*, var. *betulaefolia*, Wesmael in DC. Prodr. vol. xvi. pars 2, p. 328. *P. nigra*, var. *hudsonica*, C. K. Schneider, Ill. Handb. Laubholzk. vol. i. p. 5, fig. 4 m, n. *P. nigra*, Michx, Fl. Bor.-Am. vol. ii. p. 244, an Linn. *P. hudsonica*, Michx f. Hist. Arb. Am. vol. iii. p. 293, tab. 10, fig. 1, et N. Am. Sylva, vol. ii. p. 114, tab. 96, fig. 1. *P. betulifolia*, Pursh, Fl. Am. Sept. vol. ii. p. 619; Loudon, Arb. et Frut. Brit. vol. iii. p. 1656, fig. 1516, et Encycl. Trees and Shrubs, p. 825, fig. 1501; Dode, Extr. Monogr. Inéd. Gen. Populus, p. 48.—S. A. SKAN.

The downy-twigged Black Poplar of English collections is readily distinguished from the smooth-twigged tree commonly grown in gardens as *Populus nigra* by its more compact, rounded, Elm-like head, and by a greater tendency to develop huge burrs on its old boles. But many forms intermediate in facies between these two trees are to be met with; among these intermediates the pubescence, the presence or absence of which is so distinctive of the extreme types, varies remarkably in degree and duration without being uniformly correlated with differences in habit. The examination of many specimens from different trees conveys the impression that the pubescence can hardly be relied upon as affording a varietal character. If this conclusion be just, the status usually accorded to the downy Black

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acuminate, base wide, cuneately rounded, rarely truncate or slightly cordate, margin serrulate; often at first pubescent but soon becoming glabrous; dark green above, somewhat paler beneath; petiole reaching 2½ in. in length, at first downy. *Male catkins* 1–2 in. long; scales wide obovate, about 2 lin. long with a marginal fringe of segments nearly as long; anthers usually 11–17. *Female catkins* slender, 3–4 in. long; pedicels 1–1½ lin. long. *Capsules* ovoid, 2½–3½ lin. long.

Fig. 1, upper portion of petiole and base of leaf; 2 and 3, male flowers; 4, female flower; 5, female perianth:—*all enlarged.*

8299

[illegible]

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[illegible]

TAB. 8299.

CAMPANULA BEAUVERDIANA.

Transcaucasia and Northern Persia.

CAMPANULACEAE. Tribe CAMPANULEAE.

CAMPANULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 561.

Campanula Beauverdiana, *Fomin in Monit. Jard. Bot. Tiflis*, vol. i. p. 12, t. i. fig. 1; species *C. Steveni*, M. Bieb., affinis sed calycis tubo indumento papilloso vestito, corollaque ad tertiam partem lobata differt.

Herba glabra vel minute hirta, ad 6 dm. alta. *Rhizoma* tenue, breve. *Caules* graciles, erecti vel ascendentes. *Folia* inferiora oblongo-ovata vel late ovata, 6 cm. longa, 1·5 cm. lata, obtusa, crenato-serrata, in petiolum paullo quam lamina longiorem attenuata; folia superiora sessilia, quam inferiora minora, lineari-lanceolata vel lanceolata, acuta, parce glanduloso-denticulata; folia suprema linearia, acuminata, basi subtus tuberculo spongioso instructa. *Flores* solitares vel pauci; pedicelli graciles, ad 7 cm. longi. *Calycis* tubus anguste obconicus, 7 mm. longus, 10-costatus, inter costas papillis albis inflatis praeditus; lobi quam tubus usque ad duplum longiores, anguste lanceolati, acuminati. *Corolla* azurea, glabra, late campanulata, 3 cm. diametro, quam calycis lobi duplo vel ultra duplo longior; lobi quam tubus duplo breviores. *Filamenta* e basi subquadrata, pilosa, subulata, glabra. *Stylus* ad mediam partem divisus; rami purpurei, extra dense hirsuti. —*C. Steveni*, var. *vesiculosa*, Bornm. in Bull. Herb. Boiss. 2^{me} sér. vol. vii. p. 774.—C. H. WRIGHT.

The plant of *Campanula Beauverdiana* which forms the subject of our illustration was raised at Kew in 1908 from seed received from the Botanic Garden, Tiflis. The species was described in 1905 from specimens collected on the mountains near Mzchet, some fifteen miles from Tiflis. It has since then been described as a variety of *C. Steveni*, M. Bieb., by Dr. Bornmüller, from material gathered by himself on Mount Elburs in North Persia (not Mount Elburz in the Caucasus) at an altitude of 8,500 ft. above sea-level. In this locality it was found growing in company with typical *C. Steveni*, a widely distributed species to which, in the dried state, *C. Beauverdiana* bears a close resemblance. In the living state, however, they are readily distinguished, for the calyx of *C. Steveni* is without any indumentum, while the purple-violet corolla is lobed half-

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way down and the style-arms are longer than the undivided portion. Under his original description of *C. Beauverdiana* Dr. Fomin mentions a gathering by Sintenis from Kirkpauli in Turkish Armenia, the specimens of which were distributed as *C. Steveni* under the number 5647. At Kew, however, the specimens of Sintenis n. 5647 consist in part of *C. Steveni*, in part of *C. Beauverdiana*, so that in Armenia as in Persia the two species evidently grow together. *C. Beauverdiana* is a perennial, in character much resembling the native *C. rotundifolia*, Linn.; it thrives well and flowers freely under the conditions suited to that species, and is at its best in May and June.

Description.—*Herb*, glabrous or finely hairy, reaching 2 ft. in height, with a slender short rootstock and slender erect or ascending stems. *Leaves* below oblong-ovate or wide ovate, 2¼ in. long, ⅔ in. wide, obtuse, crenate-serrate, narrowed into a petiole rather longer than the blade; leaves higher up sessile, smaller than the lower, linear-lanceolate or lanceolate, acute, sparingly glandular toothed; uppermost leaves linear, acuminate with a spongy tubercle at the base below. *Flowers* solitary or few; pedicels slender, the longest nearly 3 in. long. *Calyx* with a narrow obconic 10-ribbed tube, about 4 lin. long, beset with white inflated papillae between the ribs; lobes narrow lanceolate, acuminate, nearly or quite twice as long as the tube. *Corolla* blue, glabrous, wide campanulate, 1¼ in. across, twice as long as the calyx-lobes or rather longer; lobes half as long as tube. *Filaments* subulate, glabrous, springing from a subquadrate, pilose base. *Style* divided to the middle, the arms purple, densely hairy on the outer side.

Fig. 1, calyx and pistil; 2 and 3, stamens:—*all enlarged.*

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M.S.del. J.N.Fitch lith.

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TAB. 8300.

RHODODENDRON KEISKEI.

Japan.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Keiskei, *Miq. Prolus. Fl. Jap.* p. 75; *Maxim. in Mém. Acad. Imp. Sc. St. Pétersb.*, 7^{me} série, vol. xvi. (1870), p. 23, t. 4, f. 11–17; species ex affinitate *R. triflori*, Hook. f., a quo differt pedicellis brevioribus, floribus minoribus, calycis lobis brevissimis, et corollae intus epunctatae tubo breviore.

Frutex 1–2-metralis, dense ramosus, ramis rigidis primum parce lepidotis. *Folia* biennia, coriacea, breviter petiolata petiolis rubris, lanceolata vel oblongo-lanceolata, cum petiolo 3–7 cm. longa, vix acuta, basi cuneata, rotundata vel interdum subcordata, supra parce obscureque lepidota, subtus pallidiora, crebre distincteque lepidota. *Flores* flavi, 4–5 cm. diametro, 3–5 aggregati, pedicellis lepidotis longiores. *Calycis* lobi lati, brevissimi, rotundati. *Corolla* late campanulata, extra parce lepidota, intus epunctata, tubo brevi, lobis aequalibus ovato-oblongis obtusis. *Stamina* 10, quam corolla breviora, declinata, filamentis filiformibus infra medium parce puberulis, antheris aurantiacis. *Ovarium* 5-loculare, densissime lepidotum, stylo glabro recurvo. *Capsula* angusta, fere cylindrica, circiter 1 cm. longa.—W. BOTTING HEMSLEY.

There are in the herbarium collection at Kew only two wild specimens named *R. Keiskei*; one of these, in flower, was collected by the late Mr. Maximowicz on the volcanic mountain Wunzen, in 1863; the other, in fruit, is from Mt. Tchako, in the province of Tosa, and was communicated by the College of Science, Tokyo University, in 1893. The plant now figured was obtained for Kew from a nursery in Yokohama in 1908, and flowered in a pot in an unheated frame in April, 1909. From this plant the flowering specimen originally collected by Maximowicz differs in the calyx-lobes being more distinctly developed and fringed on the margin, in the stamens and style being relatively longer, exceeding the corolla, and in the leaves being slightly hairy along the midrib on the upper side. The fruiting specimen received in 1893 differs in the petioles being furnished with two rows of long weak bristles which form a conspicuous

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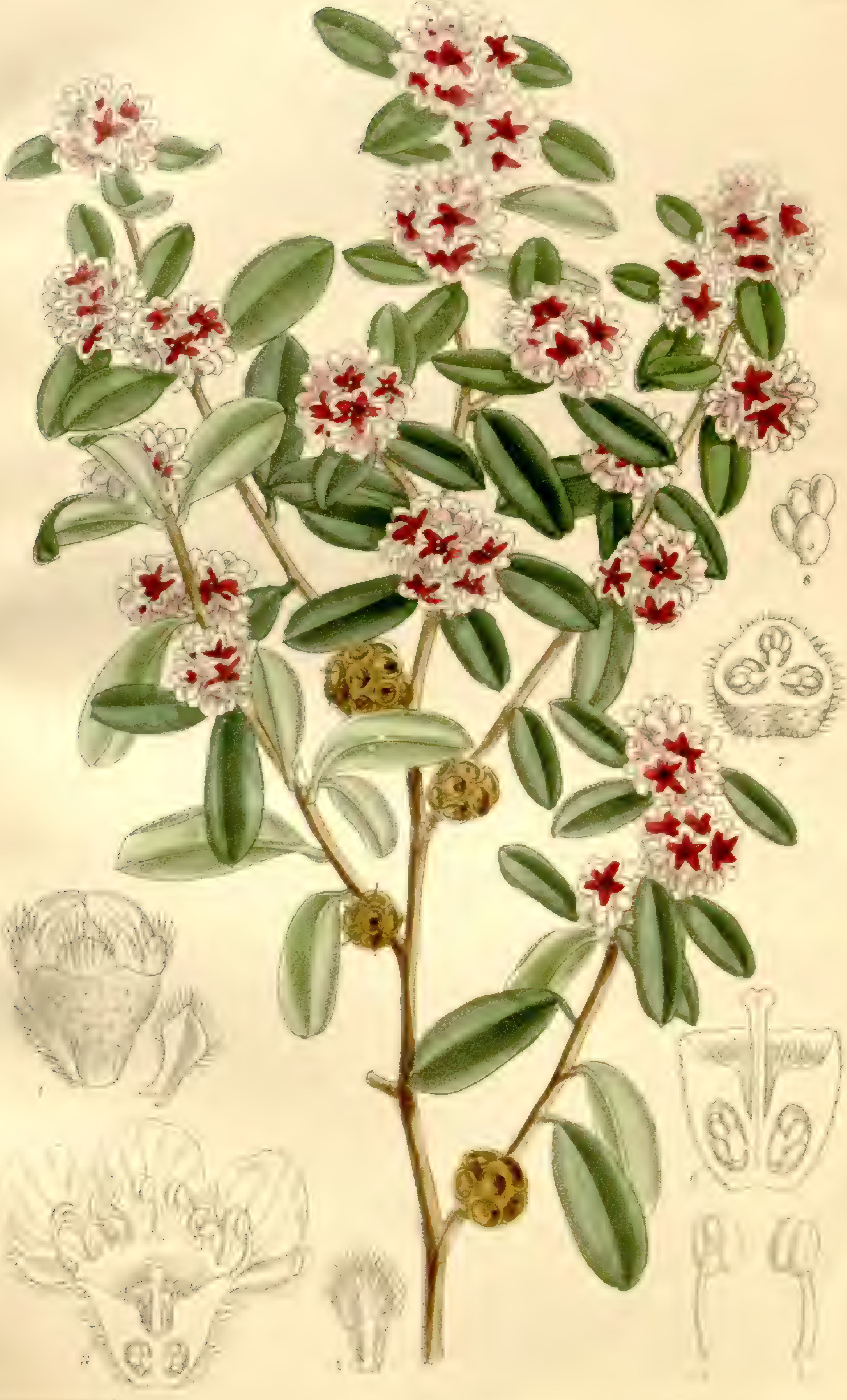
fringe. In other respects the three representatives of *R. Keiskei* at Kew agree very closely. The species is most nearly allied to *R. triflorum*, which is figured at t. 19 of the Rhododendrons of the Sikkim Himalaya. Though the plant has not yet wintered in the open air, it promises to be hardy; if this be borne out by experience, the chief value of the species will be in adding a new yellow-flowered evergreen Rhododendron to the out-door garden. It should thrive under the conditions suited to other species; a soil preferably peaty, that is free from lime and abundantly supplied with moisture.

DESCRIPTION.—*Shrub*, 3–7 ft. high, densely branched, the branches when young sparingly lepidote. *Leaves* biennial, coriaceous, short petioled, lanceolate or oblong-lanceolate, including the petiole 1¼–3 in. long, somewhat acute, base cuneate, rounded or occasionally subcordate, sparingly and obscurely lepidote above, paler beneath and closely distinctly lepidote. *Flowers* yellow, 1¾–2 in. across, in clusters of 3–5; pedicels rather long, lepidote. *Calyx-lobes* wide, rounded, very short. *Corolla* wide campanulate, sparingly lepidote outside, epunctate within; tube short, lobes equal, ovate-oblong, obtuse. *Stamens* 10, shorter than the corolla, declinate; filaments filiform, sparingly puberulous below the middle; anthers orange. *Ovary* 5-celled, very densely lepidote; style glabrous, recurved. *Capsule* narrow, nearly cylindric, about 5 lin. long.

Fig. 1, portion of a leaf; 2, a covering leaf from a young inflorescence; 3, a scale from the same; 4, calyx and pistil; 5 and 6, stamens; 7, cross-section of an ovary:—*all enlarged.*

8301



Tab. 8301.

AGONIS MARGINATA.

Western Australia.

Myrtaceae. Tribe Leptospermeae.

Agonis, *DC.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 703.

Agonis marginata, *Schau. in Pl. Preiss.* vol. i. p. 117; *Benth. Fl. Austral.* vol. iii. p. 98; affinis *A. obtusissimae*, F. Muell., sed foliis et floribus minoribus staminibusque paucioribus differt.

Frutex 2–3 m. altus, ramis et ramulis molliter pubescentibus. *Folia* obovato-oblonga, obtusa vel minute mucronulata, basi in petiolum brevem angustata, 1–3 cm. longa, 0·5–1 cm. lata, coriacea, e basi quinquenervia, margine pilis densis appressis pubescentia. *Flores* sessiles, fasciculati, fasciculis axillaribus subglobosis 10–20-floris. *Bracteolae* exteriores late orbiculares, 4 mm. diametro, dense ciliatae; interiores obovatae, concavae, 3 mm. longae, dorso carinatae, albo-villosae. *Calycis* tubus 2 mm. longus, extra parce pubescens, lobis rotundatis molliter ciliatis et sericeo-pubescentibus intus rubro-purpureis. *Petalorum* limbus suborbicularis, circiter 3 mm. diametro, glaber, albus, ungue brevi rubro-purpureo. *Stamina* 10, petalis et calycis lobis opposita. *Stylus* glaber, stigmate capitato. *Ovula* 3–4. *Fructus* conglomerati, apice loculicide dehiscentes.—*Leptospermum marginatum*, Labill. Pl. Nov. Holl. vol. ii. p. 10, t. 148. *Billiottia marginata*, G. Don, Gen. Syst. vol. ii. p. 827. *Fabricia stricta*, Lodd. Bot. Cab. t. 1219.—J. Hutchinson.

For the material on which the figure of this beautiful shrub given at plate 8301 has been based, Kew is indebted to Mr. T. A. Dorrien Smith, in whose garden at Tresco Abbey, Isles of Scilly, it grows luxuriantly in the open, though in most parts of the British Islands it is not hardy. The genus *Agonis* to which the plant belongs includes fifteen species, all of which are limited to Western Australia. In the Flora Australiensis the late Mr. Bentham has divided the genus, which as a whole was formerly deemed, owing to its alternate leaves and to the relative lengths of the stamens and petals, a section of *Leptospermum*, into two sections. The first of these, the Taxandria, were characterised by having ten stamens, regularly opposite to the calyx-lobes and petals and by having two ovules in each cell. The second section, the Ataxandria, were characterised by having, with the exception of *A. grandiflora*, twenty to thirty stamens, none of which are opposite the centres of the petals, with at the same time four to six ovules in each cell. As Mr. Hutchinson points out, however, the character derived from the number of ovules is evidently liable to some variation, and must therefore be used with caution, for in *A. marginata*, the species now depicted, while there are ten stamens strictly opposite the calyx-lobes and petals, there are three or four ovules in each cell.

DESCRIPTION.—*Shrub*, 6–10 ft. high, branches and small twigs softly pubescent. *Leaves* obovate-oblong, obtuse or finely mucronulate, narrowed at the base into a short petiole; blade $\frac{1}{2}$–$1\frac{1}{4}$ in. long, 3–5 lin. wide, coriaceous, 5-nerved from the base, margin densely pubescent with adpressed hairs. *Flowers* sessile, clustered, the clusters axillary, almost globose, 10–20-flowered; outer bracteoles wide orbicular, densely ciliate, 2 lin. across; inner obovate, concave, keeled on the back, white villous, $1\frac{1}{2}$ lin. across. *Calyx-tube* 1 lin. long, sparingly pubescent externally; lobes rounded, softly ciliate and silky pubescent, reddish purple within. *Petals* with a white, glabrous, suborbicular limb, about $1\frac{1}{2}$ lin. wide, and a short reddish purple claw. *Stamens* 10, opposite the petals and calyx-lobes. *Style* glabrous, stigma capitate. *Ovules* 3–4 in each cell. *Fruit* conglomerate, the individual fruits opening loculicidally at the tips.

Fig. 1, bud with bracteoles; 2, bracteole; 3, section of a flower; 4 and 5, stamens; 6 and 7, vertical and transverse sections of ovary; 8, placenta with ovules:—*all enlarged.*

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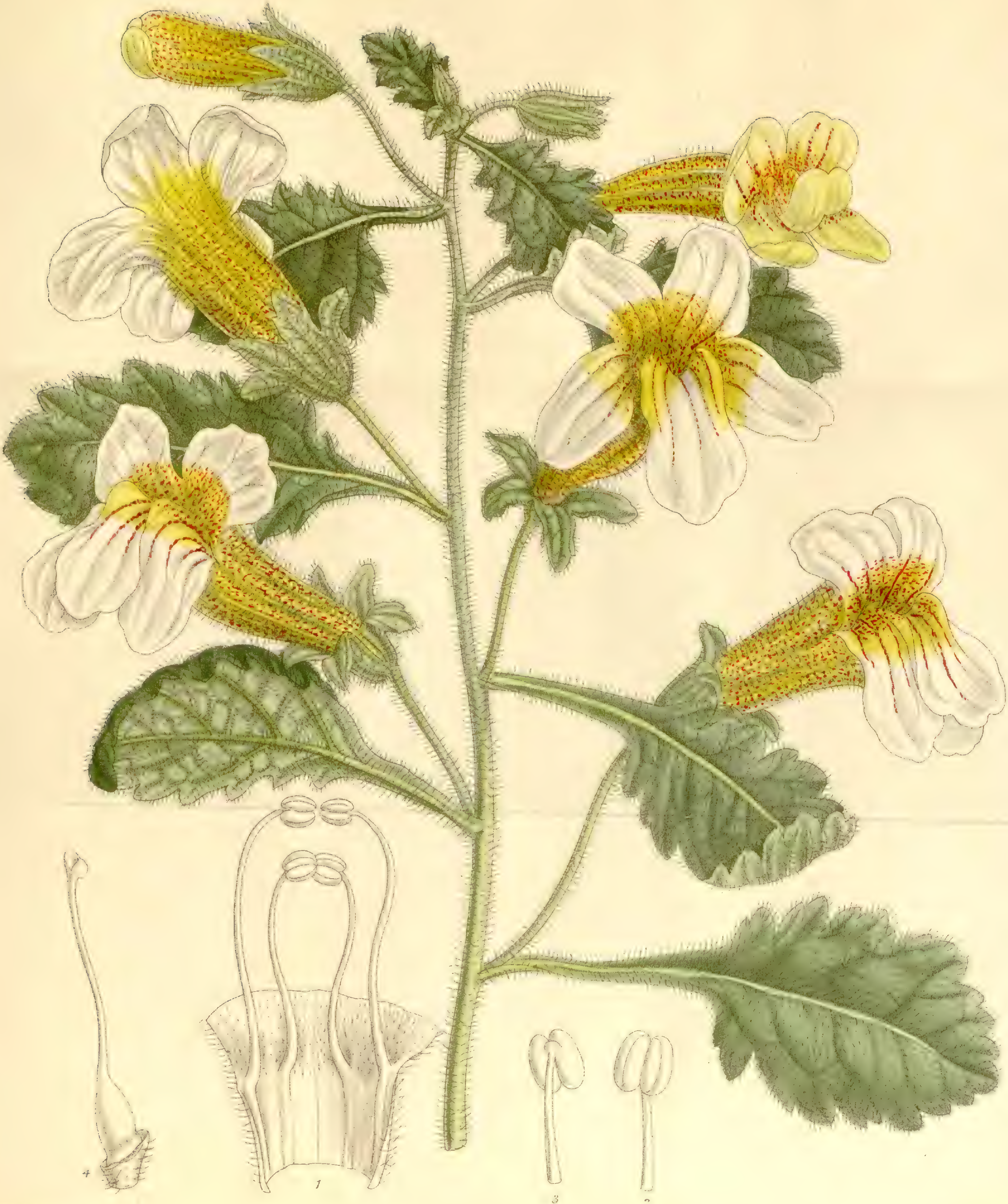

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TAB. 8302.

REHMANNIA HENRYI.

China.

SCROPHULARIACEAE. Tribe DIGITALEAE.

REHMANNIA, *Libosch*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 960.

Rehmannia Henryi, *N. E. Brown in Kew Bull.* 1909, p. 262; species affinis *R. angulatae*, Hemsl., sed humilior, foliis obtuse lobatis et dentatis, bracteis vel foliis floralibus longe petiolatis, calycis lobis latioribus et corollae lobis albis differt.

Herba perennis, 15–40 cm. alta, simplex vel basi ramosa, ubique glanduloso-pilosa. *Folia* radicalia 7–18 cm. longa, 2·5–6 cm. lata, elliptico-oblonga, obtusissima, basi in petiolum 1–6 cm. longum attenuata, crenato-dentata vel plus minusve pinnatim lobata et obtuse dentata; folia caulina simillima, gradatim minora, longe petiolata. *Flores* axillares, 3–6 cm. distantes. *Pedicelli* adscendentes, 3–5 cm. longi, basi bracteolis 1–2 subulatis 2–4 mm. longis muniti. *Calyx* adscendens (haud nutans), campanulatus, lobis patentibus; tubus 1–1·3 cm. longus; lobi subaequales, 1–1·2 cm. longi, 5–9 mm. lati, anguste vel late deltoidei vel deltoideo-ovati, obtusi, glandula brunneo-aurantiaca subapiculati, integri vel pauce dentati. *Corollae* tubus 4·5–5 cm. longus, dorsaliter compressus, apice 2 cm. latus, extra pubescens, sordide sulfureus, minute rubro-punctatus, intus inferne glaber, superne pubescens, luteus, minute rubro-punctatus; limbus obliquus, bilabiatus, 4·5 cm. diametro, albus, utrinque pubescens; labium superius bilobum, lobis subquadratis apice obtusissime rotundatis emarginatis; labium inferius fere ad basin trilobum, lobis 2·5 cm. longis 1·5 cm. latis oblongis apice rotundatis, medio lateralibus imbricato, palato bicarinato dorso faucis adpresso. *Stamina* inclusa, glabra, antherarum loculis 3 mm. longis deflexo-divergentibus. *Ovarium* ovoideum, glabrum; stylus inclusus, glaber; stigmata late rotundata.—*Rehmannia Piasezkii*, Hemsl. in Journ. Linn. Soc. vol. xxvi. p. 194, non Maxim.—N. E. BROWN.

The genus *Rehmannia* includes six known species, all natives of China, though one—*R. glutinosa*, Libosch—extends also to Japan. It has given no little trouble to systematic workers, and one suggested species—*R. ? Oldhami*, Hemsl., a native of Formosa—has recently had to be transferred to Gesneraceae and treated as the type of a distinct genus. Three of the species have already been dealt with in this work. At t. 3653, under the synonym *R. chinensis*, is given a figure of *R. glutinosa*; at t. 7191 *R. rupestris*, Hemsl., is depicted; at t. 8177, under the synonym *R. angulata*, a figure has been given of a species very nearly allied to *R. angulata*, which,

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however, is now found to deserve separate recognition. For the plant in question, Mr. Brown suggests the name *R. elata.* It is characterised by being twice as large as *R. angulata*; by having leaves with 2–6 acute entire lobes on each side in place of having either very many marginal teeth, or, if there be a few lobes or large teeth, by these being again toothed; by having bracts or flowering leaves with long cuneate bases not broader than the lamina nearer the apex, as against very broadly and rather abruptly cuneate bases which are wider than any other part of the lamina. The corolla in *R. elata* is slightly larger and is bright soft rosy purple on the lips, yellow dotted with red in the throat; in *R. angulata* the rather smaller corolla is red with a band of scarlet at the margin of the upper lip and has orange dots inside the lower lip. The species now figured is in somewhat like case; it has hitherto been treated as a form of *R. Piasezkii,* Maxim., a native of the northern parts of Shensi, which differs in being over 3 ft. high, and in having subsessile bracts or flowering leaves and purplish flowers.

Originally discovered by Mr. A. Henry about 1885 in the neighbourhood of Ichang, and subsequently collected by him near Nanto, *R. Henryi* was again met with by Mr. E. H. Wilson somewhere in the same general region. A share of the seed obtained by Mr. Wilson was communicated to Kew, in 1907, by the Director of the Arnold Arboretum, Jamaica Plain, Mass. Plants raised from this seed grew well under ordinary greenhouse treatment, and flowered in 1908 and again in 1909, when the figure now given was prepared. The species sets seeds freely, and it may prove hardy in the warmer parts of England.

Description.—*Herb*, perennial, 6–18 in. high, simple or branching at the base, glandular hairy throughout. *Leaves* at the base 3–7 in. long, 1–2¼ in. wide, elliptic-oblong, quite obtuse, their bases narrowed into a petiole ⅓–2¼ in. long, crenately toothed, or more or less pinnately lobed and obtusely dentate; cauline leaves or bracts like the basal leaves, gradually decreasing upwards, long petioled. *Flowers* axillary, 1¼–2¼ in. apart; pedicels ascending, 1¼–2 in. long, with 1–2 subulate basal bracteoles 1–2 lin. long. *Calyx* ascending, never nodding, campanulate; lobes nearly equal, spreading, 5–6 lin. long, $2\frac{1}{2}$–$4\frac{1}{2}$ lin. wide, narrowly or widely deltoid or deltoid-ovate, obtuse, with entire or sparingly toothed margins, and with a brownish-orange subapiculate gland; tube 5–$6\frac{1}{2}$ lin. long. *Corolla* tube $1\frac{3}{4}$–2 in. long, dorsally compressed, $\frac{3}{4}$ in. wide at the mouth, pubescent without and dirty yellow with minute red specks, within glabrous below, pubescent above, yellow with minute red specks; limb oblique, 2-lipped, $1\frac{3}{4}$ in. wide, white and pubescent on both sides; upper lip 2-lobed, lobes subquadrate, rounded and emarginate at the top; lower lip 3-lobed nearly to the base, lobes 1 in. long, $\frac{3}{4}$ in. wide, oblong, rounded at the tip, the lateral overlapping the central; palate 2-keeled, partially occluding the mouth. *Stamens* included, glabrous; anthers $1\frac{1}{2}$ lin. long, the cells deflexed, diverging. *Ovary* ovoid, glabrous; style included, glabrous; stigmatic lobes wide, rounded.

Fig. 1, stamens and part of a corolla, laid open; 2 and 3, anthers; 4, ovary, with style and stigma:—*all enlarged.*

8303

[illegible] [illegible]

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TAB. 8303.

AQUILEGIA ALPINA.

The Alps and Apennines.

RANUNCULACEAE. Tribe HELLEBOREAE.

AQUILEGIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 8.

Aquilegia alpina, *Linn. Sp. Pl.* 533; *All. Fl. Pedem.* vol. ii. p. 64. t. 66; *Koch, Syn. Deutsch. u. Schweiz. Fl.* ed. 3, p. 50; *Rouy et Fouc. Fl. Fr.* vol. i. p. 128; *Fiori e Paoletti, Fl. Anal. Ital.* vol. i. p. 520; floribus magnis caeruleo-purpureis, staminibus petalis brevioribus distinguitur.

Caules plures, erecti; 1–3-flori, puberuli. *Folia* radicalia plerumque biternata; petiolus et petioluli pilis longiusculis sparse puberuli; foliola ambitu rhomboideo-orbicularia, 2·5–4 cm. diametro, usque ad medium trifida, lobis inciso-crenatis, laciniis ultimis plerumque longioribus quam latis, subtus subglauca; folia caulina parva, trifoliolata vel simplicia, segmentis angustis. *Flores* 6–8 cm. diametro, caeruleo-violacei. *Sepala* patula, ovata, circiter 4 cm. longa, in unguem brevem angustata. *Petala* 3·5–4 cm. longa; lamina truncata vel leviter emarginata, quam calcar uncatum manifeste brevior. *Stamina* circiter 40, 10-seriata, exteriora brevia antheris magnis, interiora longiora antheris minoribus; filamenta superne linearia, basin versus sensim dilatata; antherae oblongae, 2–2·5 mm. longae, apiculatae, basi cordatae. *Staminodia* 10, anguste lanceolata, circiter 7 mm. longa, concava, hyalina. *Carpella* 5, dense pubescentia. *Folliculi* 2–2·5 cm. longi, pubescentes.—T. A. SPRAGUE.

Aquilegia alpina, the species here figured, is a native of the Alps of Dauphiné, Switzerland and Piedmont, and of the Tuscan and Emilian Apennines. The typical form of the species has almost straight spurs, but the degree of curvature of the spur seems to be subject to considerable variation, and the plant here depicted—which, in respect of its spur, approaches *A. Sternbergii*, Reichb., but differs from that species in its more robust habit and in having petals that exceed the stamens—is perhaps rather an extreme form than a distinct variety of *A. alpina*. For the material from which our plate has been prepared we are indebted to Mr. D. Hill, in whose rock-garden at Herga, Watford, the plant here depicted flowered freely in the early summer of 1909. The plant was obtained by Mr. A. W. Hill on the Pleine Madeleine, near Chandelon, in Valais, where the species was found growing in quantity on a small level alp bordered with low trees and shrubs, at about 5,000 ft. above

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sea-level. At the time of its collection, in the second week in August, 1907, only a few flowers remained, and most of the plants bore nearly ripe seed. A few plants, carefully dug up so as to preserve the long tap-root, were, on reaching England, potted in a mixture of sandy loam and peat, and kept during winter in a cold frame. In the following spring they were transferred to the rock-garden in a mixture of loam and peat, and in a situation where they received partial shade at different times during the day. Seeds have been produced, and some of these have germinated.

DESCRIPTION.—*Herb*, perennial; stems several, erect, 1–3-flowered, puberulous. *Leaves* at the base mostly twice ternate; petioles and petiolules sparingly puberulous; leaflets rhomboid-orbicular, 1–1¾ in. across, trifid to the middle, the lobes incised crenated, their ultimate segments usually longer than broad, somewhat glaucous beneath; stem leaves small, trifoliolate or simple, their segments narrow. *Flowers* 2½–3 in. across, blue-violet. *Sepals* spreading, ovate, about 1¾ in. long, narrowed into a short claw. *Petals* 1½–1¾ in. long, blade truncate or slightly emarginate, distinctly shorter than the hooked spur. *Stamens* about 40, 10-seriate, the outer shorter with large anthers, the inner long with smaller anthers; filaments linear above, gradually widening towards the base; anthers oblong, 1–1¼ lin. long, apiculate, cordate at the base. *Staminodes* 10, narrow lanceolate, about 3½ lin. long, concave, hyaline. *Carpels* 5, densely pubescent. *Follicles* ¾–1 in. long, pubescent.

Figs. 1 and 2, outer stamens; 3, staminodes and pistil; 4, pistil:—*all enlarged.*

TAB. 8304.

RHODODENDRON MUCRONULATUM.

Central and Eastern Asia.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (Rhodorastrum) **mucronulatum**, *Turcz. in Bull. Soc. Nat. Mosc.* 1837, n. 7, p. 155, et 1848, vol. i. p. 585; species vel forsan varietas *R. daurici*, Linn., a quo differt foliis majoribus tenuioribus acutis ante anthesin caducis et floribus majoribus numerosioribus.

Frutex nanus, ramosus, ramulis ultimis gracilibus parce lepidotis. *Folia* sparsa, internodiis quam petiolis vix longioribus, decidua, breviter graciliterque petiolata; lamina tenuia, lanceolata, 3–8 cm. longa, saepius utrinque attenuata, apiculata, margine leviter undulata, utrinque, sed praecipue subtus, obscure lepidota; petioli 3–5 mm. longi. *Gemmae* floriferae uniflorae, sessiles, 2–5 ad apices ramulorum aggregatae; squamae plus minusve lepidotae, latae, fere orbiculares, exteriores crassiores, ciliolatae, circiter 4 mm. longae, intermediae tenuiores, albae, fimbriatae, circiter 8 mm. longae, 2 vel 3 interiores lineari-spathulatae, fimbriatae, 10–12 mm. longae. *Flores* pallide rubro-purpurei, 4·5–5 cm. diametro, brevissime pedunculati. *Calyx* brevissimus, dentibus deltoideis lepidotis. *Corolla* late campanulata, extra puberula haud lepidota, intus epunctata, lobis latis imbricatis rotundatis undulatis. *Stamina* 10, declinata, alterna breviora, longiora corallam haud excedentia; filamenta infra medium pilis planis linearibus crispulis unicellulatis instructa; antherae atro-purpureae. *Ovarium* 5-loculare, lepidotum, stylo glabro curvato stamina longiora paullo excedente. *Capsula* non visa.—*R. dauricum*, var. *mucronulatum*, Maxim. Rhod. As. Or. p. 44.—W. BOTTING HEMSLEY.

Examples of this pleasing Rhododendron had been a desideratum for the Kew collection for many years, but it was not until 1907 that a batch of plants, from one of which our figure has been prepared, was obtained by purchase from a firm of nurserymen in Yokohama; these plants were actually sent as representing a variety of *R. quinquefolium*, Bisset and Moore. The section Rhodorastrum, to which *R. mucronulatum* belongs, is distinguished by the flowers being solitary in each involucre of bracts instead of being in trusses. The late Mr. Maximowicz, who looked upon our plant as a variety of *R. dauricum*, Linn., states that it is readily distinguishable from typical *R. dauricum*, as it occurs in the southern portion of its area, but that as we proceed northwards forms are found that exhibit a gradual transition to what may be considered the most reduced form of the same species. The form which may be regarded as typical *R. dauricum* was figured from the garden of Mr. Woodford, Vauxhall, at t. 636 of this work so long ago as 1803; the variety *sempervirens* is represented at t. 1888. The only other species belonging to this section is the pretty *R. virgatum*, Hook. f., portrayed at t. 5060 of this Magazine. Judging, so far as it is safe to do so, from its short existence under cultivation in this country, *R. mucronulatum* would appear to be hardy and a good grower. With their roots in a sandy peaty soil, our plants have made shoots 6 to 12 in. long during the past summer. This Rhododendron is deciduous, its leaves turning yellow before they fall; it can be increased by means of cuttings.

DESCRIPTION.—*Shrub*, dwarf and branching; the twigs slender and sparingly lepidote. *Leaves* scattered, the internodes rarely longer than the petioles, deciduous, shortly stalked; blades thin, lanceolate, 1¼–3 in. long, usually narrowed to both ends, apiculate, margins somewhat undulate, sparingly lepidote on both faces, but most markedly beneath; petioles 2–3 lin. long. *Flower-buds* sessile, 1-flowered, in groups of 2–5 near the tips of the twigs; scales more or less lepidote, wide, nearly orbicular, the outer rather firm, ciliolate, about 2 lin. long, the intermediate thinner, white, fimbriated, about 4 lin. long, the innermost 2–3 linear-spathulate, fimbriated, 5–6 lin. long. *Flowers* pale reddish-purple, 1¾–2 in. across, shortly peduncled. *Calyx* very short, with deltoid lepidote teeth. *Corolla* wide campanulate, puberulous outside, but not lepidote, epunctate within; lobes wide imbricate, rounded and undulate. *Stamens* 10, declinate, alternately shorter and longer, the longest not exceeding the corolla; filaments hirsute below the middle with flattish linear crisped 1-celled hairs; anthers very dark purple. *Ovary* 5-celled, lepidote, style glabrous, curved, rather longer than the longest stamens. *Capsule* not seen.

Fig. 1, portion of undersurface of a leaf; 2, calyx and pistil; 3, a scale from the pistil; 4 and 5, stamens; 6, hairs:—*all enlarged.*

8505

M.S. del. J.N.Fitch lith.

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TAB. 8305.

PITTOSPORUM COLENSOI.

New Zealand.

PITTOSPORACEAE. Tribe PITTOSPOREAE.

PITTOSPORUM, *Banks*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 131.

Pittosporum Colensoi, *Hook. f. Fl. Nov.-Zel.* vol. i. p. 22; *Cheeseman, Man. N. Zeal. Fl.* p. 53; affinis *P. tenuifolio*, Banks et Sol., a quo foliis coriaceis marginibus planis et bracteis subpersistentibus distinguitur.

Arbuscula cortice nigro. *Ramuli* validiusculi, fusci, pilis longis mollibus puberuli. *Folia* patentia, versus apicem recurva, elliptico-oblonga, oblongo-lanceolata vel obovato-oblonga, apice acuta, basi obtusa vel rotundata, 3-7 cm. longa, 2-3 cm. lata, coriacea, supra saturate viridia, subnitidula, costa pallidiore, subtus pallide viridia, crebre reticulata; petioli usque ad 1 cm. longi. *Inflorescentia* terminalis et axillaris, floribus solitariis vel ternis. *Bracteae* pedicellos inferne imbricantes, subpersistentes, oblongae, acutae vel apiculatae, 3·5–5·5 mm. longae, 3–3·5 mm. latae, purpureae, extra sparse brunneo-villosae, praesertim versus margines. *Pedicelli* 8–10 mm. longi. *Sepala* latissime ovata, apiculata, 4·5 mm. longa, 3·5–4·5 mm. lata, extra sparse villosa. *Petala* oblanceolata, obtusa vel rotundata, 1·5 cm longa, 5 mm. lata, valde reflexa, marginibus leviter reflexis. *Filamenta* 6·5 mm. longa, glabra; antherae 2·5 mm. longae. *Ovarium* ovoideo-oblongum, 4 mm. longum, sparse villosum, 2–3-loculare; stylus 2 mm. longus; stigma capitatum viridi-luteum.—*P. tenuifolium*, var. *Colensoi*, Kirk, Stud. Fl. N. Zeal. p. 47.—T. A. SPRAGUE.

The genus *Pittosporum* is confined to the eastern hemisphere throughout the more mildly temperate and subtropical regions of which its species, some fifty in number, are widely spread. It is most highly differentiated in New Zealand, which is the home of about twenty-five per cent. of the forms so far characterised. Already seven plates in this work have been devoted to the illustration of its species; tt. 1396, 1684, 2075, 3161, 4799, 5978 and 7473. For the material from which the figure now given of yet another form, *P. Colensoi*, Hook f., has been prepared, we are indebted to Mr. T. A. Dorrien Smith, in whose garden at Tresco Abbey, Isles of Scilly, this species, which in most other parts of the United Kingdom is decidedly tender, forms a handsome shrub which thrives vigorously and flowers freely in the open. *P. Colensoi* is very nearly allied to *P. tenuifolium*, Banks & Sol.; so many forms that appear to be intermediate between the two have been reported that the late Mr. T. Kirk, in his "Student's Flora of New Zealand," has treated the subject of our plate as a variety of *P. tenuifolium.* Mr. T. F. Cheeseman, however, in his "Manual" has recently vindicated the right of *P. Colensoi* to the specific status accorded to it by Sir J. D. Hooker. The chief distinguishing features of our plant, as compared with *P. tenuifolium*, are the larger, more coriaceous and flat leaves, and the more persistent bracts. Some of the intermediate forms which lend weight to Kirk's view are in cultivation in this country, and specimens of such have been communicated to the Kew herbarium from the Royal Botanic Gardens, Glasnevin, and from the gardens of Trinity College, Dublin, and of the Royal Horticultural Society. The flowers of these intermediate forms are, however, mostly like those of *P. tenuifolium*, while the leaves, though approaching in texture those of *P. Colensoi*, have undulate margins. For its cultivation a sandy soil with an admixture of peat is most suitable, and the most satisfactory mode of propagation is by cuttings in heat.

DESCRIPTION.—*Shrub*; bark blackish; twigs stout, tawny, puberulous with long soft hairs. *Leaves* spreading, their tips recurved, elliptic-oblong, oblong-lanceolate or obovate-oblong, acute, the base usually obtuse or rounded, 1¼–3 in. long, ¾–1¼ in. wide, coriaceous, dark green with a paler midrib and somewhat glossy above, pale green and closely reticulated beneath; petiole 4–5 lin. long. *Inflorescences* terminal and axillary; flowers solitary or in threes; bracts more or less persistent, closely covering the pedicels, oblong, acute or apiculate, 2–3 lin. long, 1½–2 lin. wide, purple, sparingly brown hairy outside especially towards the edges; pedicels 4–5 lin. long. *Sepals* very wide ovate, apiculate, 2–2½ lin. long, 1½–2 lin. wide, sparingly villous outside. *Petals* oblanceolate, obtuse or rounded, dark red, 8 lin. long, 2½ lin. wide, markedly reflexed, the margins also slightly reflexed. *Filaments* 3½ lin. long, glabrous; anthers 1½ lin. long. *Ovary* ovoid-oblong, 2 lin. long, sparingly hairy, 2–3-celled; style 1 lin. long; stigma capitate, yellowish green.

Fig. 1, unopened flower, with pedicel and bracts; 2, stamens and pistil; 3 and 4, anthers; 5, pistil:—*all enlarged.*

8306

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt

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TAB. 8306.

NOTYLIA TRISEPALA.

Mexico.

ORCHIDACEAE. Tribe VANDEAE.

NOTYLIA, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 586.

Notylia trisepala, *Lindl. in Paxt. Fl. Gard.* vol. iii. (1852–3) p. 45; *Reichb. f. Xen. Orch.* vol. i. p. 49; inter species affines sepalis lateralibus liberis vel subliberis distincta.

Herba epiphytica, nana. *Pseudobulbi* oblongi, subcompressi, vix 1 cm. longi, vaginis conduplicatis oblongis acutis imbricatis obtecti, monophylli. *Folia* oblonga, subobtusa, coriacea, 4–8 cm. longa, 1·5–3 cm. lata. *Scapi* penduli, 7–16 cm. longi, vaginis lanceolatis obtecti; racemi cylindrici, multiflori. *Bracteae* oblongo-lanceolatae, acutae, 1–1·5 mm. longae. *Pedicelli* 3–6 mm. longi. *Flores* pallide virides. *Sepalum* posticum erectum, ovato-oblongum, acutum, 3–4 cm. longum; sepala lateralia libera vel sublibera, incurva, oblonga, subacuta, 4–5 mm. longa. *Petala* suberecta, incurva, ovato-oblonga, subacuta, 3–4 mm. longa. *Labellum* suberectum, breviter unguiculatum, trulliformi-ovatum, subobtusum, 3–4 mm. longum, basi obtuse carinatum. *Columna* clavata, 2–3 mm. longa; anthera ovata: pollinia 2, cerea, ovoidea, ad apicem stipitis longi tenuis affixa, glandula parva.—R. A. ROLFE.

The genus *Notylia* includes about twenty species, all of which are natives of Tropical America. While none of them can be considered showy Orchids, most of them are characterised by a certain degree of grace and charm; two other species of the genus have already, on this account, found a place in this work; *N. bicolor*, Klotzsch, at t. 5609, and *N. albida*, Klotzsch, at t. 6311. The species now figured, *N. trisepala*, Lindl., was first described over half a century ago from a plant of unrecorded habitat which had flowered in the collection of Mr. Van Houtte at Ghent. In 1895 a plant possessing similar characters was sent to Kew for determination by Mr. Kienast Zolly of Zurich; this example was stated to have been obtained from Mexico. The plant which forms the subject of our plate flowered in May, 1909, in the collection of Mr. W. E. Ledger, Wimbledon, by whom it was presented to Kew. This plant reached Mr. Ledger from his friend Mr. Hermessen, who had collected it at Samborne, Vera Cruz, Mexico.

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DESCRIPTION.—*Herb*, epiphytic, dwarf. *Pseudobulbs* oblong, somewhat compressed, barely 5 lin. long, clothed with conduplicate, oblong, acute sheaths, 1-foliate. *Leaves* oblong, somewhat obtuse, coriaceous, 1¾–3 in. long, ¾–1¼ in. wide. *Scapes* pendulous, 3–7 in. long, clothed with lanceolate sheaths; racemes cylindric, many-flowered; bracts oblong-lanceolate, acute, 5–8 lin. long; pedicels 1½–3 lin. long. *Flowers* pale green. *Sepals*, the posterior erect, ovate-oblong, acute, 1½–2 lin. long; the lateral free or nearly so, incurved, oblong, subacute, 2–2½ lin. long. *Petals* suberect, incurved, ovate-oblong, subacute, 1½–2 lin. long. *Lip* suberect, shortly clawed, ovate-scoopshaped, almost obtuse, 1½–2 lin. long, the base bluntly keeled. *Column* clavate, 1–1½ lin. long; anther ovate; pollinia 2, waxy, ovoid, attached at the tip of a long slender stalk, gland small.

Fig. 1, a flower; 2, column and lip; 3 and 4, column from a young flower; 5, anther-cap; 6, pollinia:—*all enlarged.*

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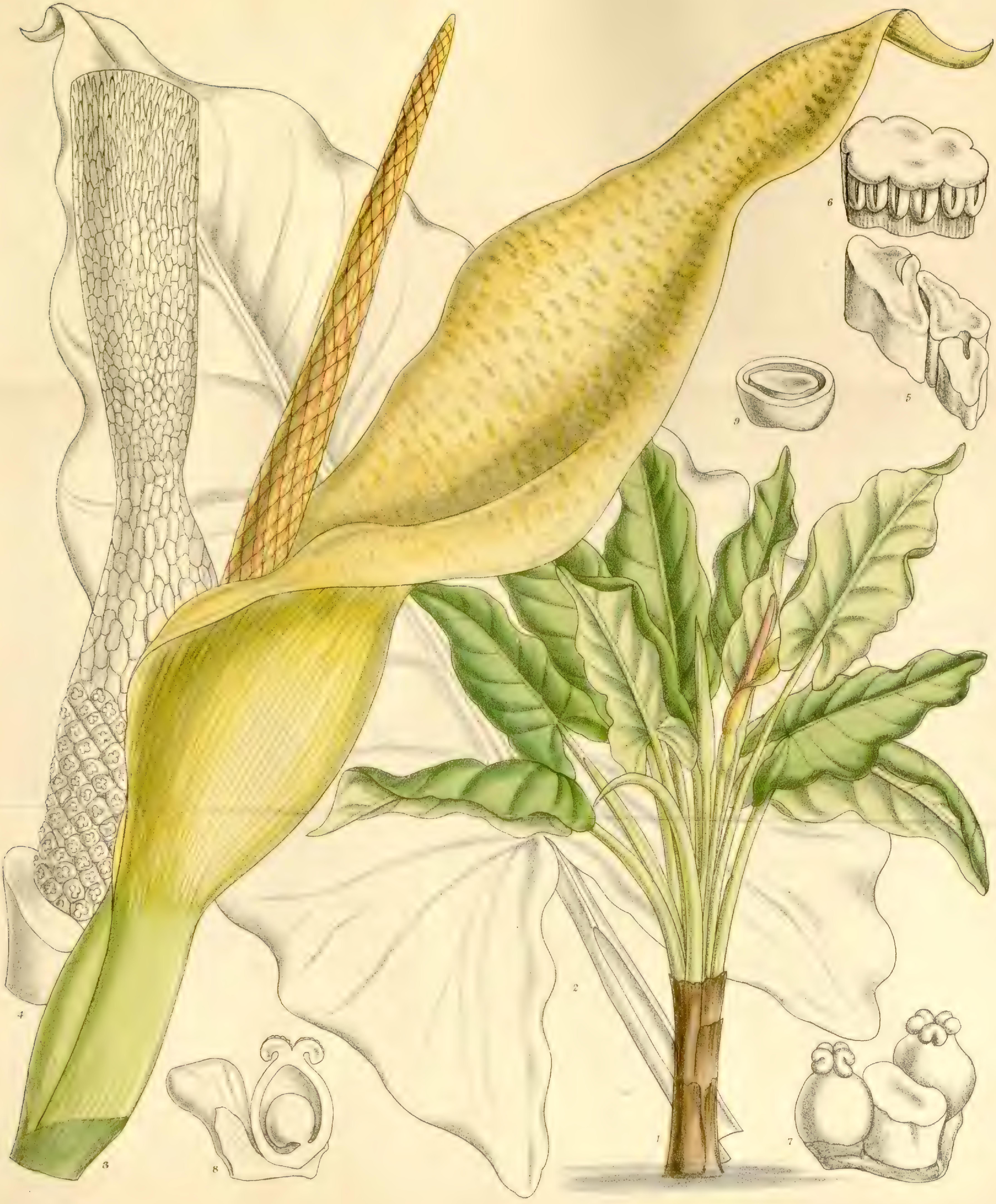

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TAB. 8307.

TYPHONODORUM LINDLEYANUM.

Madagascar.

ARACEAE.

TYPHONODORUM, *Schott*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 977.

Typhonodorum Lindleyanum, *Schott in Oest. Bot. Wochenbl.* 1857, p. 70; *Gen. Aroid.* t. 43, et *Prodr.* p. 161; *Engl. in DC. Monogr. Phanerog.* vol. ii. p. 332; species unica.

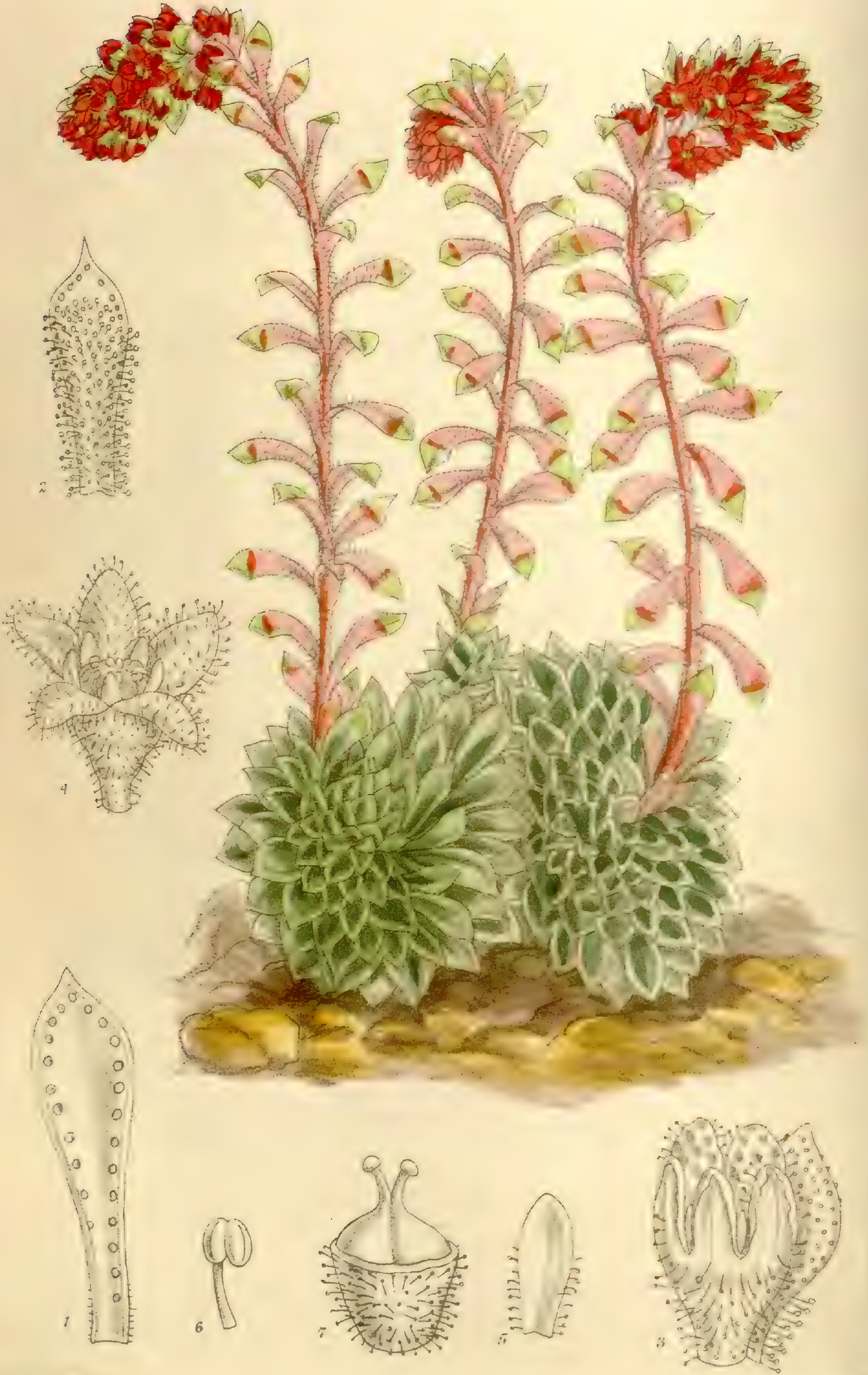
Planta robusta, glabra, caule 1–3 m. alto et 10–30 cm. crasso, fibrosis vaginarum vestigiis vestito. *Foliorum* petioli 0·60–1·30 m. longi, validi, teretes, supra leviter concavi vel carinati et in utroque latere carinae leviter concavo-canaliculati, longe vaginati; lamina 0·35–1·05 m. longa, 18–60 cm. lata, ovata, acuta vel subacuminata, basi profunde cordata vel sagittata, lobis basalibus rotundatis vel deltoideis obtusis sinu triangulari aperto sejunctis. *Pedunculus* petiolo brevior, teres, 2·5–4 cm. crassus, viridis. *Spatha* suberecta, 40–60 cm. longa; tubus 8–13 cm. longus, oblongus, viridis; lamina 32–47 cm. longa, 8–13 cm. lata, lanceolata, acuminata, basi convoluta, superne explanata, undulata, utrinque flavida. *Spadix* 25–41 cm. longus; inflorescentia feminea 5–9 cm. longa, neutra 3–5 cm. longa, mascula fertilis 4–9 cm. longa, sterilis superior 13–18 cm. longa, flavo-aurantiaca. *Flores feminei* nudi, organis neutris paucis interdum commixti; ovarium ovoideum, 1-loculare, 1-ovulatum; stigma sessile 3-4-lobum; ovulum erectum, anatropum. *Flores masculi* nudi, inferiores antheris 4–8 in synandrium truncatum connatis, superiores steriles. *Baccae* magnae. *Semina* 2–2·5 cm. diametro, compresso-orbicularia.—*T. madagascariense*, Engl. Bot. Jahrb. vol. i. p. 188.—N. E. BROWN.

The gigantic evergreen Aroid which forms the subject of our illustration is a native of Madagascar, where it grows in water or in marshy places. It has, however, been introduced thence to the Island of Johanna in the Comoros, to Mauritius and it is also believed to Reunion, on account of its seeds which are eaten by the inhabitants. It develops an arboreous unbranched caudex crowned with a tuft of large sagittate leaves. The plant from which our drawing was made was presented to Kew in 1905 by the Royal Botanic Gardens, Dahlem, Berlin; placed in a bed of mud along with the Egyptian paper reed, it has grown vigorously and attained its present dimensions. It flowered at Kew for the first time in May, 1909, and afterwards developed ripe seeds, from which seedlings have been raised. Some of the seeds germinated in the bottom of the spathe.

APRIL, 1910.

Description.—*Shrub*, all parts glabrous. *Stem* stout, 3–10 ft. high, 4–12 in. thick, clothed with the fibrous remains of old leaf-sheaths. *Leaves* long-petioled; blade 1¼–3½ ft. long, 7 in. to 2 ft. across, ovate acute or almost acuminate, deeply cordate or sagittate, the basal lobes rounded or deltoid, obtuse, with a wide triangular sinus between; petiole stout, terete, long-sheathing, 2–4½ ft. long, slightly concave or keeled above and somewhat concavely channelled on either side of the keel. *Peduncle* shorter than the petiole, green, terete, 1–1¾ in. thick. *Spathe* suberect, 1½–2 ft. long; tube 3–5 in. long, oblong, green; blade 13–19 in. long, 3–5 in. across, lanceolate, acuminate, convolute below, somewhat flattened above, margins undulate, yellow on both faces. *Spadix* 10–16 in. long; female portion 2–3½ in. long, neuter 1¼–2 in. long, male fertile portion 1¾–3½ in. long, sterile upper portion 5½–7 in. long, orange yellow. *Female flowers* naked, mixed at times with a few neuter flowers; ovary ovoid, 1-celled, 1-ovuled. *Male flowers* naked, the lower with 4–8 anthers connate in a truncate synandrium, the upper sterile. *Berry* large. *Seed* 1¾–2 in. across, flattened-orbicular.

Fig. 1, sketch of plant, showing habit; 2, leaf and apex of petiole; 3, inflorescence; 4, part of spadix; 5, three barren male flowers; 6, a fertile male flower; 7, two female flowers with a neuter organ between them; 8, longitudinal section of a female flower and a neuter organ; 9, transverse section of an ovary:—1–3 *reduced*, 4 *of natural size*, 5–9 *enlarged.*



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Tab. 8308.

SAXIFRAGA Grisebachii.

South East Europe.

Saxifragaceae. Tribe Saxifrageae.

Saxifraga, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 635.

Saxifraga (Kabschia) Grisebachii, *Degen et Dörfl. in Denkschr. Acad. Wiss. Wien.* vol. lxiv. p. 721; *Irving in Gard. Chron.* 1909, vol. xlvi. p. 195, fig. 81; **affinis** *S. Frederici-Augusti*, Bias., **sed foliis basalibus majoribus confertis et patentibus differt.**

Herba caespitosa, caudiculis brevibus dense foliosis; caules floriferi erecti, foliosi, 10–15 cm. alti, dense et patule glanduloso-pilosi. *Folia* inferiora imbricata, patula, sessilia, spathulato-lingulata, apice rotundato-mucronata, 0·5–2 cm. longa, 0·4–0·6 cm. lata, supra foveolis intramarginalibus numerosis, subtus carinata, margine cartilagineo versus basin parce ciliato; folia caulina patentia, oblongo-spathulata, circiter 1 cm. longa et 3 mm. lata, rubella, apice in mucronem viridem contracta, utrinque mucrone excepto dense glanduloso-pilosa. *Inflorescentia* racemosa vel subspicata; pedicelli bracteis multo breviores. *Calyx* rubro-purpureus, dense glanduloso-pilosus; lobi inaequales, oblongo-elliptici, apice rotundati, usque ad 6 mm. longi. *Petala* erecta, elliptico-lanceolata, purpurea, circiter 2 mm. longa, vix 1 mm. lata, inferne ciliata. *Stamina* petalis vix longiora.—J. Hutchinson.

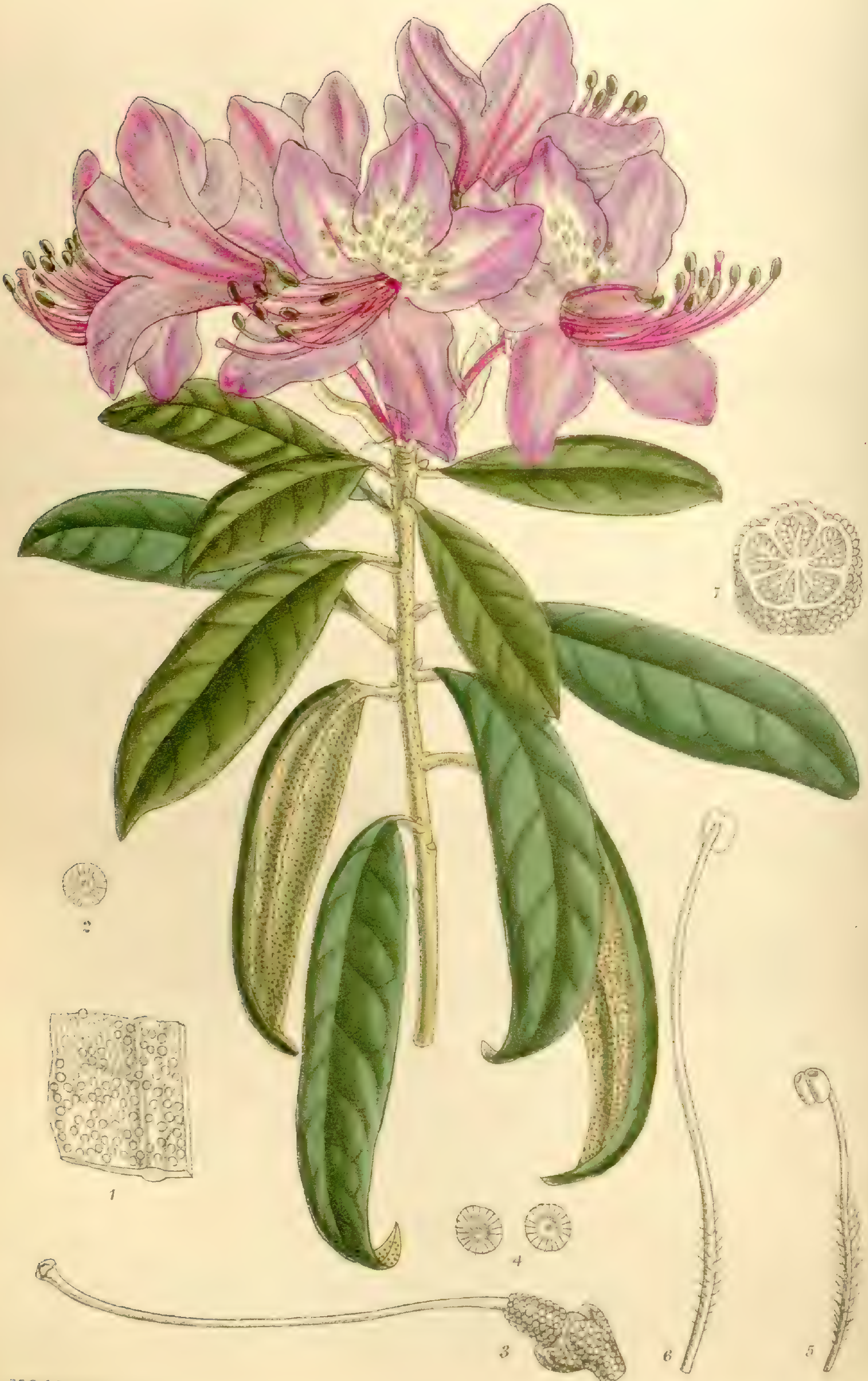
The Saxifrage which forms the subject of our illustration is a native of the mountains of Albania and Central Macedonia. It was introduced into cultivation in 1902, in which year it received a first class certificate from the Royal Horticultural Society. It is a member of the section *Kabschia*, Engl., which includes three other species with red flowers and with somewhat similar foliage and habit, *S. Frederici-Augusti*, *S. media*, and the recently introduced *S. Stribrnyi*. From the first of these *S. Grisebachii* is readily distinguished by having larger and more spreading basal leaves. The two others differ from our plant mainly in having a branched inflorescence with distinctly pedicelled flowers. At Kew *S. Grisebachii* is grown in pots in a cold frame, and is transferred in March, when it comes into flower, to the Alpine House, where it continues in blossom for a month or more. When grown out of doors the plant, though quite hardy in other respects, is apt to suffer in winter from excess of moisture.

April, 1910.

Description.—*Herb*, with short tufted densely leafy bases, the flowering stems erect, leafy, 4–6 in. high, rather densely beset with spreading glandular hairs. *Leaves* at the base imbricate, sessile, spathulate-ligulate, with rounded mucronate tips, 3–10 lin. long, 2–3 lin. wide, with numerous intramarginal pits on the upper side, keeled beneath, margin cartilaginous and sparingly ciliate near the base; stem-leaves spreading, oblong-spathulate, about 5 lin. long, under 2 lin. wide, reddish with an abruptly narrowed green tip, rather densely glandular hairy except at the tip. *Inflorescence* racemose or subspicate, the pedicels much shorter than the bracts. *Calyx* reddish-purple, densely glandular hairy; lobes unequal, oblong elliptic, rounded at the tip, the largest 3 lin. long. *Petals* erect, elliptic-lanceolate, purple, about 1 lin. long, barely half as wide, ciliate towards the middle and at the base. *Stamens* hardly exceeding the petals.

Fig. 1, a basal leaf; 2, a stem leaf; 3, a bract and flower; 4, flower; 5, petal; 6, stamen; 7, pistil:—*all enlarged.*

8309



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TAB. 8309.

RHODODENDRON HARROVIANUM.

Western China.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron Harrovianum, *Hemsl. in Gard. Chron.* 1910, vol. xlvii. p. 4; species ex affinitate *R. heliolepidis*, Franch., a quo differt foliis angustioribus minus distincte apiculatis, corollae lobis acutis et staminibus exsertis.

Frutex 60–90 cm. altus; rami recti, rigidi, primum lepidoti, internodiis quam petiolis vix brevioribus. *Folia* sparsa, persistentia, coriacea, superiora patentia; lamina anguste lanceolata, 3–7 cm. longa, obscure apiculata, basi cuneata, margine recurva, supra atroviridia, nitida, laevia, costa impressa, subtus creberrime lepidota, lepidibus parvis, costa valida, elevata; petiolus crassiusculus 4–8 mm. longus. *Flores* 3–5 in ramorum apicibus aggregati, pedicellati, pedicellis crassiusculis, 1·5–2 cm. longis saturate rubris albo-lepidotis. *Calyx* brevissimus, obscure lobatus vel fere truncatus. *Corolla* campanulata, 2–2·5 cm. longa, lobis latis, extra parte inferiore saturate rubro-purpurea, albo-lepidota, lobis violaceo-purpureis, intus violaceo-purpurea, lobis superioribus flavo-maculatis. *Stamina* 10, exserta, alterna longiora, usque ad 3·5 cm. longa; filamenta supra basin et infra medium zona pilorum longorum patentium ornata. *Ovarium* 5-loculare, creberrime lepidotum; stylus glaber, cum ovario circiter 3–3·5 cm. longus. *Capsula* non visa.—W. BOTTING HEMSLEY.

The Rhododendron that forms the subject of our figure, which has been drawn from material supplied by Messrs. J. Veitch & Sons from a plant that flowered in their nursery at Coombe Wood in April, 1909, is one of the hardiest of the species newly introduced from China, where it was discovered by Mr. E. H. Wilson. All the plants now in cultivation have been raised from imported seeds, but judging by its appearance and by the behaviour of allied species, it is probable that its propagation by means of cuttings may be successfully accomplished. *R. Harrovianum*, which flowered at Coombe Wood for the first time in 1907, has grown well there under conditions adapted to Rhododendrons in general; a peaty, sandy soil and abundant moisture. In addition to *R. heliolepis*, Franch., to which, as Mr. Hemsley points out, it is nearly allied, our plant may also be compared with *R. coombense*, Hemsl., figured at

t. 8280 of this work, from which it differs in its longer leaves, its larger, violet-purple flowers, and its exserted stamens.

Description.—*Shrub*, 2–3 ft. high; branches straight, rigid, at first lepidote; internodes nearly as long as the petioles. *Leaves* scattered, persisting, coriaceous, the upper spreading; blade narrow lanceolate, 1¼–3 in. long, slightly apiculate, cuneate at the base, the margin recurved, dark green shining smooth and with the midrib sunk above, beneath closely lepidote with fine scales and with a stout raised midrib; petiole rather stout, 2–4 lin. long. *Flowers* pedicelled, in clusters of 3–5 at the tips of the branches; pedicels rather stout, ½–¾ in. long, reddish and dotted with white scales. *Calyx* very short, faintly lobed or almost truncate. *Corolla* campanulate, ¾–1 in. long, lobes broad, tube deep reddish-purple and dotted with white scales outside in the lower part, higher up like the lobes outside violet-purple, within corolla uniformly violet-purple save for yellowish blotches on the upper lobes. *Stamens* 10, exserted, alternately longer and shorter, the longest 1½ in. in length, filaments with a band of longish spreading hairs above the base but below the middle. *Ovary* 5-celled, closely lepidote; including the quite glabrous style 1¼–1½ in. long. *Capsule* not seen.

Fig. 1, portion of underside of a leaf; 2, a scale from the same; 3, calyx and pistil; 4, scales from the ovary; 5 and 6, stamens of each series; 7, section of ovary:—*all enlarged.*

8310

M.S.del. J.N.Fitch lith.

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TAB. 8310.

DIPELTA FLORIBUNDA.

China.

CAPRIFOLIACEAE. Tribe LONICEREAE.

DIPELTA, *Maxim. Bull. Acad. Pétersb.* vol. xxiv. (1878) p. 50, *quoad plantam floriferam tantum*; *Hemsl. in Gard. Chron.* 1908, vol. xliv. p. 101.

Dipelta floribunda, *Maxim. Bull. Acad. Pétersb.* vol. xxiv. p. 51, et *in Mél. Biol.* vol. x. p. 80; *Spooner in Gard. Chron.* 1907, vol. xlii. p. 2 cum figura; species typica, a *D. ventricosa*, Hemsl., imprimis bracteolis peltatis, corolla infra medium in tubum angustum constricta et corollae lobis longioribus distinguenda.

Frutex saepius 3–5 m. altus, habitu vultoque *Diervillae* specierum nonullarum, ramis elongatis graciliusculis primum puberulis, internodiis quam folia saepius brevioribus. *Folia* opposita, exstipulata, breviter petiolata, tenuia, decidua, lanceolata, ovato-lanceolata, vel ovata, saepius 5–10 cm. longa, acuminata, acuta, basi subcuneata vel rotundata, integra, primum puberula, demum glabrescentia, subtus pallidiora; venae primariae laterales utrinque circiter 4, primum pilosulae ultimis reticulatis pellucidis; petioli 3–6 mm. longi. *Flores* ad foliorum axillas fasciculati; pedunculi breves, saepius 2-foliati et 3–6-flori; pedicelli graciles, 1–1·5 cm. longi, puberuli. *Bracteae* lineares, puberulae, 7–10 mm. longae, cito deciduae. *Bracteolae* 6, valde difformes, nempe 2 minimae infra pedicelli medium positae, oppositae, cito deciduae; 4 persistentes, per anthesin accrescentes, demum scariosae, venosae, juxta ovarii basin enatae, confertae; 2 exteriores vel inferiores minores, inaequales, 1 antica, 1 postica; antica major, ovata, obtusa, basi lata, pedicellum amplexans, plene evoluta circiter 1·5 cm. longa; postica similis nisi minor, circiter 0·5 cm. longa; 2 interiores vel superiores majores, rotundato-oblongae, leviter obliquae, auriculaeformes, peltatae, 2–2·5 cm. diametro maximo, capsulam omnino occultantes. *Calycis* limbus ad basin 5-partitus; lobi subaequales, lineares, circiter 5 mm. longi, glandulosi, acutissimi, persistentes. *Corolla* albo-rosea, inflato-tubulosa, bilabiata, circiter 3 cm. longa; tubus infra medium constrictus, cylindricus; limbi lobi subaequales, rotundato-oblongi, patentes, circiter 1 cm. longi, labio inferiore intus striis aurantiacis ornato. *Stamina* 4, didynama, inclusa. *Ovarium* inferum, hirsutum, 4-loculare; loculi 2 fertiles, 1-ovulati; 2 steriles ovula plura imperfecta includentes; stylus filiformis, glaber, leviter exserta. *Fructus* (immaturus tantum visus) angulatus, lobis calycinis coronatus, circiter 1·5 cm. longus, intra bracteolas accrescentes occultatus.—W. BOTTING HEMSLEY.

The genus *Dipelta* has, owing to the absence of complete material, never hitherto been fully described. The late Mr. Maximowicz, by whom it was founded on specimens of the species here illustrated, could only report of the fruit, which

APRIL, 1910.

we now know to be a small dry capsule, concealed within the scarious accrescent bracteoles, as "said to be a red edible berry." Perfect seeds were sent to England in December, 1904, by Mr. E. H. Wilson to Messrs. J. Veitch & Sons, but none exist in the herbarium at Kew. These seeds, gathered at altitudes of from 6,500 to 8,000 ft. above sea level in Western China, were sown by Messrs. Veitch early in 1905, and produced plants from one of which came the material from which our figure has been prepared. Three other species of *Dipelta* have been described; *D. yunnanensis*, Franchet, *D. elegans*, Batalin, and *D. ventricosa*, Hemsl., all from Western China. In the herbarium at Kew there are specimens in fruit of yet another form discovered by Mr. A. Henry in Hupeh in Central China. This is noted by Henry as possibly a new species; it is a tree 10–40 ft. high, and has larger and much broader leaves than *D. floribunda*, to which it is most nearly allied, and of which the late Professor Batalin considered it to be a state. This doubtful form, like *D. yunnanensis* and *D. elegans*, is not yet in cultivation, but the herbarium material available does not indicate that any one of the three is superior as an ornamental plant to the species now figured, or to *D. ventricosa*, figured at t. 8294 of this work. In the nursery of Messrs. Veitch at Coombe Wood, *D. floribunda* forms a free-growing bush of rounded habit about 4 ft. high, bearing in general appearance a resemblance to one of the Bush Honeysuckles, or to a *Diervilla*. It requires a good, loamy soil and can be increased by cuttings. It is quite hardy, and flowers during May.

DESCRIPTION.—*Shrub* often 10–16 ft. high, in habit recalling some of the Diervillas; branches long, rather slender, at first puberulous; internodes mostly shorter than the leaves. *Leaves* opposite, without stipules, short-petioled, thin, deciduous, lanceolate, ovate-lanceolate, or ovate, often 2–4 in. long, acute and acuminate, somewhat cuneate or rounded at the base, entire, at first puberulous but soon glabrescent, rather paler on the underside; main nerves about 4 on each side, somewhat hairy at first, the fine reticulate venation translucent; petioles 2–3 lin. long. *Flowers* clustered in the leaf-axils; peduncles short, usually 2-leaved and 3–6-flowered; pedicels slender, 5–8 lin. long, puberulous. *Bracts* linear, puberulous, 3–5 lin. long, soon disappearing. *Bracteoles* 6, dissimilar; the lowest pair below the middle of the pedicel very small, opposite, soon disappearing; the remaining four close-set near the base of the pistil, persistent, accrescent, ultimately scarious, strongly veined; of these the two outer or lower anterior and posterior, both smaller than the two inner or upper, but themselves unequal; the anterior lower ovate, obtuse, wide-based, embracing the pedicel and about 8 lin. long, the posterior similar but only about 3 lin. long; the two upper or inner rounded-oblong, slightly oblique, auriculaeform, peltate, ¾–1 in. across in the widest part when mature, and quite concealing the capsule. *Calyx* limb 5-partite, lobes nearly equal, linear, about 2½ lin. long, glandular, very pointed, persistent. *Corolla* pale rose, inflated tubular, 2-lipped, about 1¼ in. long; tube narrowed below the middle, cylindric; lobes nearly equal, rounded-oblong, spreading, about 5 lin. long; lower lip marked with orange lines. *Stamens* 4, didynamous, included. *Ovary* inferior, hirsute, 4-celled, with 2 fertile 1-ovuled cells and 2 sterile cells with several imperfect ovules in each; style filiform, glabrous, somewhat exserted. *Fruit* (only seen unripe) angled, tipped by the persistent calyx lobes, about 8 lin. long, hidden by the accrescent bracteoles.

Fig. 1, peltate bracteoles, calyx and pistil; 2, the same with one peltate bracteole removed; 3, base of the corolla, laid open; 4, anther:—*all enlarged.*

8311

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TAB. 8311.

CORNUS NUTTALLII.

Western North America.

CORNACEAE.

CORNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 947.

Cornus Nuttallii, *Audubon, Birds of North Am.* ed. fol. el. (1837) t. 367 (nomen) et ed. norm. (1842), vol. iv. pp. 313, 315, t. 279; *Torr. & Gray, Fl. N. Am.* vol. i. p. 652; *Sargent, Silva N. Am.* vol. v. p. 69, t. 214; *Eastwood, Trees of California*, p. 73, t. 51; *C. K. Schneider, Ill. Handb. Laubholzk.* vol. ii. p. 454, fig. 31 h, m.; affinis *C. floridae*, Linn., sed elatior, foliis ad obovatum vergentibus vix vel breviter acuminatis subtus copiosius pilosis, involucro majore, bracteis abrupte apiculatis vel acuminatis distincta.

Frutex vel *arbor*, 15–24 m. alta, cortice griseo laevi, ramis nisi novellis glabris fuscis. *Folia* plerumque obovata vel obovato-elliptica, breviter vel obscure acuminata, 5–12 cm. longa, 4–9 cm. lata, supra primo adpresse pilosa, citissime glabrata, subtus canescentia, molliter pilosa vel villosula, nervis utrinque circiter 5; petioli 6–15 mm. longi. *Bracteae* involucrantes plerumque 6, obovatae, breviter apiculatae, rarius acuminatae, albidae, luteo- vel interdum rubro-suffusae, 4–8 cm. longae, 2·5–7 cm. latae. *Florum* capitula 1·4–2 cm. diametro; flores fertiles cum sterilibus mixti. *Calyx* extra adpresse griseo-pubescens. *Petala* viridi-albida. *Drupae* paucae perfectae inter abortivas minores numerosas, oblongae, rubrae, 8–12 mm. longae, apice calyce persistente nigrescente coronatae.—*Benthamia Nuttallii*, Nakai in Tokyo Bot. Mag. vol. xxiii. p. 41.—O. STAPF.

The subject of our plate is the noblest of the Cornels. It is met with on the Pacific coast of North America from British Columbia and Vancouver Island to Southern California, and is common on the Coast Mountains down to Monterey. In the most favourable conditions, and especially in the Redwood forests of Northern California, it attains a large size; one tree is recorded as reaching a height of 100 ft. Professor Sargent and Miss Eastwood speak of it as one of the most beautiful of trees, gorgeous in autumn with its red fruits and brilliantly coloured foliage; a recent writer in the Gardeners' Chronicle says that on this account the tree is spared even by the settler. The involucre, often loosely spoken of as the flower, is at times 6 in. across, with individual bracts 2¾ in. wide. The first botanist to discover

APRIL, 1910.

the species was Mr. David Douglas, about 1826; at that time it was believed to be only a form of *C. florida*, and it was not recognised as distinct till it was rediscovered by Mr. Thomas Nuttall, some ten years later, during a journey to the Pacific coast. In the 1837 elephant folio edition of the Birds of North America, which consists of plates only, t. 367 is devoted to *Columba fasciata*, with which is associated a branch of this Cornel. In the 1842 edition of the same work, which is accompanied by letterpress, Audubon explains his indebtedness to his friend Nuttall for the information that the berries of this hitherto uncharacterised tree form a staple food of this particular pigeon. In publishing the technical description added by Nuttall to his notes, Audubon took the opportunity to dedicate the species to his friend.

There is no indication that seeds of *C. Nuttallii* reached England at the time of its discovery by Douglas, but we learn from Audubon that on its rediscovery by Nuttall seeds were transmitted to Lord Ravensworth, and further, that information had reached America that these seeds had germinated. In spite, however, of its introduction seventy years ago, *C. Nuttallii* has never been common in this country, and it certainly is not so amenable to the artificial conditions of cultivation as most of the dwarfer Cornels are. During the spring of 1909, however, the species flowered at Kew, in the garden of Mr. B. E. C. Chambers at Haslemere, and with Messrs. Veitch & Sons at Coombe Wood. The Kew plant, from which our main figure has been made, was purchased from a French nurseryman in 1904, and is now 5 ft. high and quite healthy; during the past season it has made shoots 1 to 1½ ft. long. It is growing in a sandy loam to which some peat and decayed leaves have been added. Our experience with this Cornel has not been sufficiently prolonged to justify a dogmatic statement as to its treatment, but we should recommend for it a well-drained loamy soil abundantly reinforced with decayed leaves—the ordinary "leaf-soil" of the gardener, a sunny, sheltered position, and attention to the matter of watering whilst the plants are young and the root system is not extensive. A heavy cold soil is probably as ill-suited for it as a very dry sandy one. Perhaps the finest plant of *C. Nuttallii* in this country is one in the garden of Mr. Chambers, who supplied from it the fruit depicted in our plate; it is a small tree, about 15 ft. high, with a single stem. Mr. Chambers informs us that he finds the number of bracts in an involucre to vary from 4 to 8. Judging by our six years' experience, the species appears to be hardy enough, except that the succulent tips of the shoots are sometimes cut back. This seems to expose it to fungoid attacks, and in this way a number of young plants have been lost at Kew.

Description.—*Shrub* or *tree*, reaching 50–85 (rarely 100) ft. in height; bark grey and smooth; twigs glabrous except when quite young, tawny. *Leaves* usually obovate or obovate-elliptic, shortly or faintly acuminate, 2–4½ in. long, 1¾–3½ in. wide, at first adpressed hairy above but soon glabrous, hoary beneath and softly pubescent; nerves about 5 on each side; petioles 3–8 lin. long. *Bracts* of the involucre usually 6, obovate, shortly apiculate, rarely acuminate, whitish and tinged with yellow or occasionally with pink, 1¾–3¼ in. long, 1–2¾ in. wide. *Flowers* in heads 7–10 lin. in diameter; the fertile accompanied by sterile flowers. *Calyx* adpressed grey-pubescent externally. *Petals* greenish-white. *Drupes* few perfect mixed with many smaller abortive ones, oblong, red, 4–6 lin. long, tipped by the persistent blackish calyx.

Fig. 1, part of underside of a leaf; 2, flower; 3, vertical section of calyx and pistil:—*all enlarged.*

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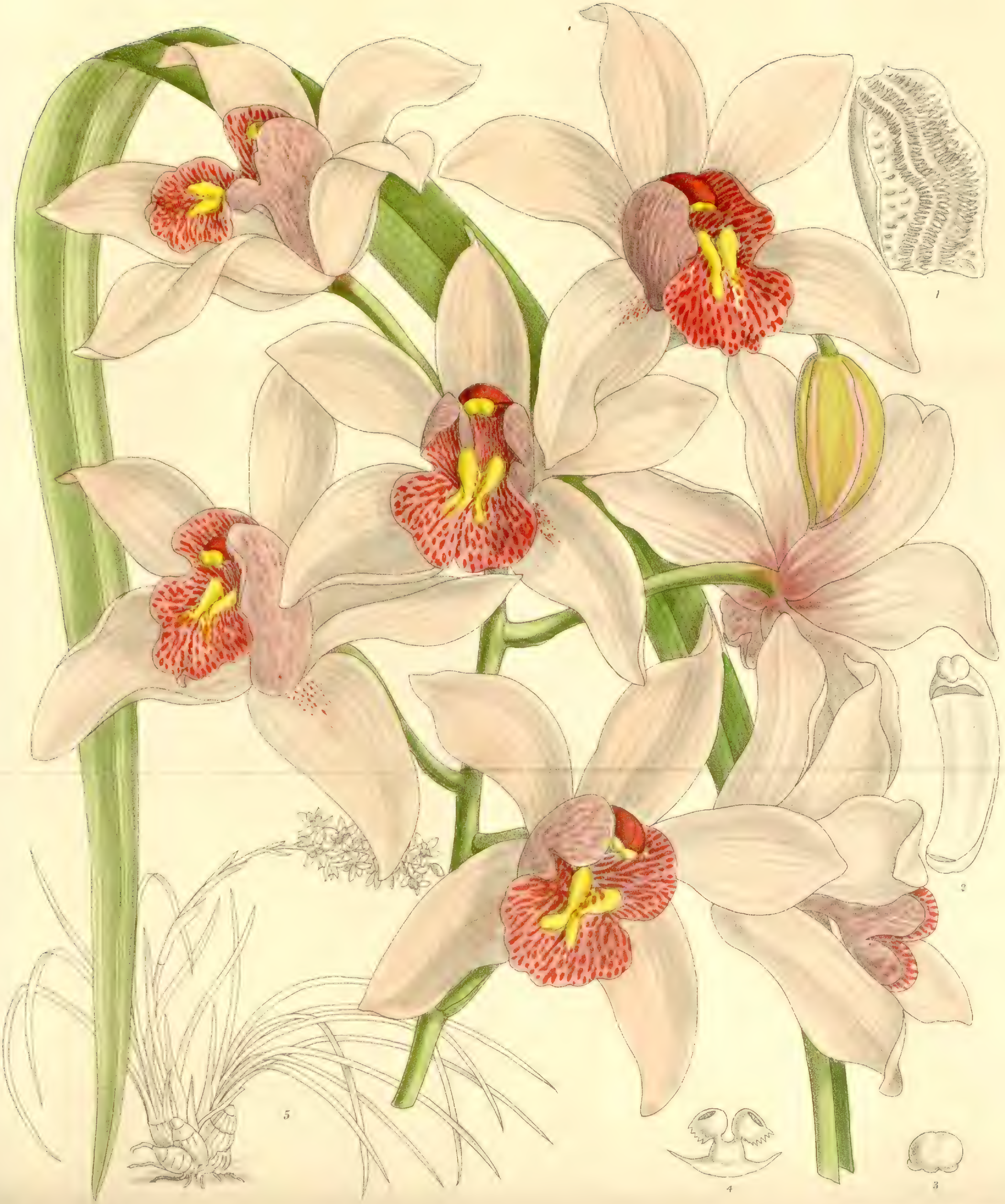

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TAB. 8312.

CYMBIDIUM INSIGNE.

Annam.

ORCHIDACEAE. Tribe **VANDEAE.**

CYMBIDIUM, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 536.

Cymbidium insigne, *Rolfe in Gard. Chron.* 1904, vol. xxxv. p. 387; *Orch. Rev.* 1904, p. 230; 1906, p. 175; *Rev. Hort.* 1907, pp. 495, 496, fig. 166, et ic. col.; *Le Jardin*, 1907, p. 309, fig. 170; *Rev. Hort. Belge*, 1907, p. 53, ic. col.; *Dict. Ic. Orch. Cymb.* t. 10; affine *C. grandifloro*, Griff., sed floribus minoribus dilute roseis et labello suborbiculari distinctum.

Herba; pseudobulbi ovoidei, 6–7 cm. longi. *Folia* elongata, lineari-oblonga, acuta, subcoriacea, 0·5–1 m. longa, 1·3–1·5 cm. lata, basi latiora, conduplicata. *Scapi* suberecti, 0·75–1·25 m. longi, vaginis lanceolatis acutis obtecti; racemi multiflori. *Bracteae* ovatae, acutae, 5 mm. longae. *Pedicelli* 5–6 cm. longi. *Flores* speciosi. *Sepala* et *petala* patentia, subaequalia, elliptico-oblonga, subacuta, dilute rosea, 4–5 cm. longa, apice subrecurva. *Labellum* suborbiculare, trilobum, 3·5–4 cm. longum, dilute roseum, purpureo-maculatum, lobis lateralibus erectis subincurvis apice rotundatis, lobo intermedio suborbiculari obtuso vel emarginato, disco villoso et callis geminis velutinis luteis a basi fere ad apicem instructo. *Columna* clavata, incurva, 2·5 cm. longa.—*Cymbidium Sanderi*, Hort. Sander ex Gard. Chron. 1905, vol. xxxvii. pp. 108, 115, fig. 49; Garden, 1905, vol. lxviii. p. 1, t. 1277.—R. A. ROLFE.

The handsome *Cymbidium* here depicted, which is perhaps the most beautiful member of the genus, was first met with in Annam by Mr. G. Bronckart in February, 1901, growing along ravines and in sandy soil at elevations of from 4,000 to 5,000 ft. above sea-level. Later in the year one of Bronckart's specimens, accompanied by an excellent painting of the plant, was presented to Kew by Mr. G. Schneider; on these the original description of the species was based. According to Bronckart's field note the plant as met with by him is always terrestrial; the spikes in wild plants are from 3 to 4½ ft. in length and bear each from ten to fifteen light-red flowers. Living plants were subsequently sent to this country. In 1904 the species was again met with in Annam by Mr. W. Micholitz when exploring on behalf of Messrs. Sander & Sons, and again dried specimens, with spikes said by

Mr. O'Brien to give evidence of having had seven or eight flowers, and living plants once more reached this country. The plants of this second consignment were distributed under the name *C. Sanderi*, which name, however, cannot now be taken up. In February, 1908, a fine flower spike was presented to Kew by Mr. J. Gurney Fowler, from a plant in his collection at Glebelands, South Woodford, and a living specimen which flowered at Kew in March, 1909, and from which our illustration was prepared, was presented to the collection by Messrs. Sander. The colour of the sepals and petals varies in cultivated plants from white to rose, and there are forms in which the spots on the labellum are even darker than is shown in our plate. The species thrives well under the treatment that best suits *C. grandiflorum* and *C. Tracyanum*; the temperature of a warm greenhouse, a compost consisting of two parts fibrous loam and one part leaf soil with a sprinkling of silver sand and small potsherds. Liberal supplies of water should be afforded whilst growth is being made; thereafter the soil should be kept dry for a few weeks.

DESCRIPTION.—*Herb*; pseudobulbs ovoid, 2½–3 in. long. *Leaves* elongate, linear oblong, acute, 1½–3½ ft. long, 6–8 lin. wide, rather wider at the base, conduplicate. *Scapes* suberect, 2½–4 ft. long, clothed with lanceolate acute sheaths; racemes many-flowered; bracts ovate, acute, 2½ lin. long; pedicels about 3 lin. long. *Flowers* handsome; sepals and petals spreading, subequal, elliptic-oblong, subacute and somewhat recurved at the tip, pale rose, 1¾–2 in. long. *Lip* suborbicular, 3-lobed, 1¼–1½ in. long, pale rose with purple blotches; lateral lobes erect, rounded and somewhat recurved at the tip, mid-lobe suborbicular, obtuse or emarginate, the disk villous and bearing two yellow velvety thickened lines extending from the base almost to the tip. *Column* clavate, incurved, 1 in. long.

Fig. 1, crests of the labellum; 2, column; 3, anther-cap; 4, pollinia; 5, sketch of a plant, showing habit:—*all enlarged except 5, which is much reduced.*

8313

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd. imp.

L. Reeve & Co. London

TAB. 8313.

PRIMULA FORRESTII.

Western China.

PRIMULACEAE. Tribe PRIMULEAE.
PRIMULA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula Forrestii, *Balf. f. apud Forrest in Not. Roy. Bot. Gard. Edin.* 1908, pars xix. p. 228, cum icon.; affinis *P. bullatae*, Franch., sed bracteis, pedicellis, calyce et corolla haud aureo-farinosis differt.

Herba perennis, 15–90 cm. alta, corolla excepta undique dense glanduloso-pubescens. *Rhizoma* elongatum, crassum, lignosum, apice foliorum annotinorum vestigiis obtectum. *Folia* omnia radicalia, chartacea, irregulariter duplo-crenata vel vix duplo-dentata, juvenilia, subtus sulphurea mox viridescentia; infima reflexa, ovato-elliptica, apice obtusa, basi rotundata vel cuneata, 3·5–5 cm. longa, 1·5–3·3 cm. lata; petioli compressi 3–4 cm. longi; superiora erecta, oblonga elliptico-oblonga vel ovato-oblonga, apice obtusa, basi cordata vel subtruncata, 5–11 cm. longa, 2·5–5·5 cm. lata; petioli supra plani, subtus convexi, 6–9 cm. longi. *Scapi* erecti, robusti, 8–23 cm. longi, folia aequantes vel superantes, umbellum simplicem multifloram gerentes. *Flores* sulfurei; pedicelli 1–4 cm. longi; bracteae foliaceae, late lanceolatae. *Calyx* campanulatus, 10 mm. longus, lobis ovatis apice rotundatis 3 mm. longis. *Corollae* tubus basi cylindricus, superne infundibuliformis, 14 mm. longus, fauce saturate aurantiaco; limbus 2 cm. diametro, lobis luteis late obcordatis. *Capsula* ovoidea, calyce inclusa.—W. G. CRAIB.

The figure of the handsome *Primula* which forms the subject of our plate has been prepared from material supplied in May, 1909, by Bees, Limited, by whom the species was introduced to cultivation through their collector, Mr. G. Forrest, whose name has been associated with the plant by Professor Bayley Balfour. The species was met with by Mr. Forrest on the eastern flank of the Likiang range in North-western Yunnan at from 9,000 to 11,000 ft. above sea-level. According to him, it is usually found growing in the crevices of dry shady limestone cliffs. It has a long, very tough woody rootstock, with a much tapering base, reaching a total length of 2–3 ft., only 2–3 in. being enclosed in the rock. The free portion is pendulous, except for a few inches at the tip, where it turns outwards and upwards, the upper two-thirds being clothed with the remains of the leaves of former years which, at the apex, form a dense matted mass. This extensive covering, taken in conjunction with the fact that behind the larger specimens the rock has been scored and worn into grooves over an inch deep by the motion of the whole plant in the breeze, seems to indicate that some individuals must reach a considerable age. *P. Forrestii* in habit greatly resembles *P. bracteata*, Franch., and *P. bullata*, Franch., both of which also affect limestone rocks, and to both of which it is morphologically very nearly allied. From the former our species is readily distinguished by the corolla tube exceeding the calyx, by the longer scapes, and by the cordate bases of its larger upper leaves; from the latter it is easily separated owing to the fact that the bracts, pedicels and calyx are not farinose. The leaves when young are sulphur-yellow on the underside, but become green beneath as they mature. The plants growing at Kew have proved healthy in a cold frame; whether they may prove hardy in the open it is not yet possible to say. They have thriven well in a loamy soil, forming a many-crowned tuft.

DESCRIPTION.—*Herb*, perennial, 6 in. to 3 ft. high, densely covered with glandular hairs except on the corolla. *Rootstock* long, stout and woody, clad, especially at the apex, with the remains of old leaves. *Leaves* all radical, chartaceous, irregularly twice crenate or almost toothed, when young yellow, soon becoming green, beneath; the lowest reflexed, ovate-elliptic, obtuse with base cuneate or rounded, 1½–2 in. long, ¾–1¼ in. wide, the petioles compressed, 1¼–1½ in. long; the upper erect, oblong, elliptic-oblong, or ovate-oblong, obtuse with base subtruncate or cordate, 2–4¼ in. long, 1–2¼ in. wide, the petioles flattened above, convex beneath, 2½–3½ in. long. *Scapes* erect, stout, 3–9 in. long, as long as or longer than the leaves; umbels simple, many-flowered. *Flowers* sulphur-yellow with a deep orange eye; pedicels ⅓–1½ in. long; bracts wide lanceolate, leafy. *Calyx* campanulate, 5 lin. long; lobes ovate with rounded tips, under 2 lin. long. *Corolla* with a tube 7 lin. long, cylindric at the base, funnel-shaped upwards, throat deep orange; limb ¾ in. across, lobes widely obcordate, sulphur-yellow. *Capsule* ovoid, enclosed in the calyx.

Fig. 1, calyx and pistil; 2, the same, calyx in section; 3, section of corolla; 4 and 5, anthers:—*all enlarged*.

M.S. del J.N. Fitch lith.

Vincent Brooks, Day & Son Ltd imp

L. Reeve & Co London.

TAB. 8314.

NOTHOFAGUS ANTARCTICA, var. ULIGINOSA.

Temperate South America.

CUPULIFERAE. Tribe QUERCINEAE.

NOTHOFAGUS, *Blume, Mus. Bot. Lugd.-Bat.* vol. i. p. 307.—Fagus, *Linn.*, sect. Nothofagus, *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 410.

Nothofagus antarctica, *Oersted in Vidensk. Selsk. Sk.* ser. 5, vol. ix. p. 354; *De Wildeman, Voy. Belgica*, p. 73; *Dusén in Svensk. Exped. Magell.* vol. iii. n. 5, p. 198; *Elwes & Henry, Trees of Great Brit. & Ireland*, vol. iii. p. 553, t. 202, f. 1; var. **uliginosa**, *Reiche, Beitr. Chil. Buchen*, p. 11; *Macloskie in Rep. Princeton Univ. Exped. Patag.* vol. viii. p. 328; *Elwes & Henry*, l.c. p. 554; a typo foliis utrinque pilis minutis erectis vestitis differt.

Arbor interdum magnum vel in montibus arbuscula vel frutex; rami sparse albido-lenticellosi, juniores pilis erectis dense vestiti; gemmae ovoideae, leviter compressae, 3 mm. longae, glabrae, squamis paucis obtectae. *Folia* oblongo-ovata, elliptico-ovata vel ovata, 1–2·5 cm. rarius usque ad 4 cm. longa, 6 mm. - 1·5 cm. rarius usque ad 2·5 cm. lata, apice rotundata, basi inaequalia, truncata vel leviter cordata, irregulariter crebreque crenulato-denticulata, interdum obscure lobata, supra atro-viridia, infra pallidiora, utrinque pilis minutis erectis vestita, primo plicata; nervi saepius utrinque 4; petiolus 1–4 mm. longus, pubescens. *Flores masculi* axillares, solitarii vel interdum geminati, breviter pedunculati. *Perianthium* campanulatum, 4 mm. longum, saepe 5-lobatum, lobis late ovatis circiter 2 mm. longis uno saepius ceteris minori parce ciliatis. *Stamina* 10–29, exserta; antherae lineari-oblongae, 2·5–3·5 mm. longae, conspicue apiculatae. *Flores feminei* axillares, sessiles. *Fructus* involucrum 4-valvatum; valvae oblongae, 5–6 mm. longae, parce ciliatae, quaque squamis 3–5 transversis brevissimis scariosis rubidis praedita. *Nuculae* 3, circiter 4 mm. longae, media 2-alata, laterales 3-alatae.—*Fagus antarctica*, Forster, var. *uliginosa*, A.DC. in DC. Prodr. vol. xvi. pars 2, p. 120; Bean in Kew Bull. 1906, p. 381. *F. uliginosa*, Phil. ex A.DC. l.c.—S. A. SKAN.

The Southern Beeches, at one time considered congeners of the Northern ones, are now usually treated as belonging to a distinct genus, *Nothofagus*, which includes 17 species, whereof 8 are South American, 6 belong to the New Zealand flora, and 3 are Australian or Tasmanian. These southern species differ from the members of the northern genus *Fagus* in that the male flowers are solitary, geminate, or in threes, while the fruit, which is relatively small and contains 1–3 nutlets, usually has the 2–4 involucral valves with transverse entire toothed or lobed scales. They are evergreen or deciduous trees or shrubs with usually very small leaves.

MAY, 1910.

Nothofagus antarctica is widely spread in temperate South America from lat. 38° S. to Tierra del Fuego, where, as in Patagonia, it and the evergreen *N. betuloides* are the dominant trees. But while *N. antarctica*, in one or other of its forms, has several times been introduced to the gardens of Great Britain—its earliest introduction was effected by Sir Joseph Hooker, 70 years ago, when he was attached to the famous expedition under Sir James Ross in the "Erebus" and "Terror"—it never appears to have become permanently established in this country. A goodly number of fine examples of its natural companion, *N. betuloides*, may be met with in the milder parts of the British Isles, but of *N. antarctica* itself there are few. Indeed, if we except the young trees raised from seed brought from Chili by Mr. H. J. Elwes in 1902, there is but one well-known specimen; this grows at Hafodunos in Denbighshire, and is believed to be over 30 years old. From this it would seem as if the species is not altogether adapted to our climate. Yet the young trees in the collection at Kew are growing with remarkable vigour, and passed through the trying winter of 1908–9 without injury.

According to Mr. Elwes, *N. antarctica* is the commonest species met with by him, during his South American journey, at high elevations on both sides of the Chili-Argentine frontier. He found it associated with *Araucaria* at 4,000 ft. above sea-level, and it occurs frequently in marshy situations on the plain of Valdivia. The variety here figured is known in Chili as "Mere." It forms a dense scrub on the Argentine side of the frontier; near the Baths of Chillian it goes up to 7,000 ft. or even higher, and covers the summits of the mountains round Lake Nahuel-huapi up to 6,000 ft. When seen here by Mr. Elwes in the month of February the leaves had turned a brilliant red. This variety was again met with by the Princeton University Expedition growing in Patagonian swamps and in woods at Chubut in the Argentine Andes. The individual which supplied the material on which our figure is based was raised from seed collected by Mr. Elwes near Lake Meliquina. It is now a small tree, 16 ft. high; it flowered very freely in a clump of heaths near the Pagoda at Kew in May, 1909. The plants at Kew are grown in various soils; those in the average sandy loam with which a little peat has been mixed thrive best. Our young trees are of rather thin, open habit, making, at present, annual shoots 1–3 ft. in length. Their distichous mode of branching adds to the peculiar elegance and distinctiveness of their appearance. Propagation is readily effected by means of layers, but it is doubtful whether trees so raised will make such well-grown specimens as those obtained from seed.

Description.—*Tree*, often of considerable size; at high elevations a small tree or shrub; branches sparingly white-lenticelled; twigs densely covered with erect hairs; buds ovoid, somewhat compressed, under 2 lin. long, glabrous, with few scales. *Leaves* oblong-ovate, elliptic-ovate, or ovate, $\frac{1}{3}$–1 in., rarely $1\frac{1}{2}$ in. long, 3–8 lin., rarely 1 in. wide, tip rounded, base unequal, truncate or slightly cordate, irregularly closely crenate denticulate, occasionally obscurely lobed, dark green above, paler beneath, with minute erect hairs on both sides, plicate when young; nerves usually 4 on each side, petiole 2 lin. long or less, pubescent. *Male flowers* axillary, solitary or occasionally geminate, shortly peduncled. *Perianth* campanulate, 2 lin. long, often 5-lobed; lobes .wide ovate, sparingly ciliate, about 1 lin. long, one usually smaller than the others. *Stamens* 10–20, exserted; anthers linear-oblong, 1–$1\frac{1}{2}$ lin. long, distinctly apiculate. *Female flowers* axillary, sessile. *Fruit* with a 4-valved involucre; valves oblong, about 3 lin. long, sparingly ciliate, each with 3–5 very short transverse scarious reddish scales. *Nutlets* 3, about 2 lin. long, the central 2-winged, the two lateral 3-winged.

Fig. 1, portion of a leaf; 2, male flowers; 3, stamen; 4, bract; 5, perianth of a female flower; 6, the same, laid open; 7, ovaries, the involucre removed; 8, fruit, showing involucre and nutlets; 9, nutlet:—*all enlarged.*

8315

M.S. del. J.N. Fitch lith.

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TAB. 8315.

CORNUS FLORIDA, var. RUBRA.

Eastern North America.

CORNACEAE.

CORNUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 950.

Cornus florida, *Linn. Sp. Pl.* 117; **var. rubra**, *Hort. Parsons*; *Rev. Hort.* 1894, p. 600; species *C. Nuttallii*, Audub., et *C. Kousae*, Buerg., proxime accedens, ab hac tamen bracteis amplioribus haud acuminatis foliisque majoribus facile distinguenda, ab illa involucris annotinis statim sejunguenda.

Arbor dumosa sylvestris interum 10-metralis, culta potius arbuscula 4–5-metralis, ramis patentibus; ramuli teretes, rubescentes, mox glabrescentes. *Folia* lata elliptica ovatave, apice breviter acuminata, utrinque sed praesertim subtus pubescentia, 7·5–12·5 cm. longa, 4–7·5 cm. lata, supra saturate viridia, subtus pallidiora glaucescentia. *Bracteae* involucrantes saepissime 4 per autumnum genitae, per hiemem capitulum terminale foventes, primo vere inflorescentes denique aestate ineunte plane evolutae inflorescentiam speciosam 7·5–11·5 cm. latam praebentes; singulae petaloideae, obcordatae, 3–5 cm. longae, roseae nervis parallelis saturatioribus notatae, apice emarginato plus minusve deflexae. *Flores* 6 mm. longi in capitulum densum 1·3 cm. latum aggregati. *Calycis* lobi 4, obtusi, pubescentes. *Corollae* lobi 4, liguliformes, apice lutescente excepto virides, pubescentes. *Stylus* columnaris; stigma truncatum. *Fructus* ovoideus, 1·3 cm. longus, maturitate rubescens; caro tenuis, farinulenta; semina pro quaque pyrene 1 vel 2.—W. J. BEAN.

Cornus florida, according to Sargent, is one of the commonest and most generally distributed of deciduous trees and shrubs in the Middle and Southern United States, and occurs at all elevations from sea-level to nearly the summits of the higher Alleghany Mountains. The type, figured in 1801, at t. 526 of this work, has been in England nearly 200 years. It was in the nursery of Thos. Fairchild at Hoxton in 1730; nine years later it was in the Chelsea Botanic Garden. The variety figured, which is rare in a wild state, was first introduced by Messrs. Parsons, of Flushing, New York. The material for our figure was supplied by Mr. B. E. C. Chambers, from his garden at Grayswood Hill, Haslemere, which contains a remarkable assemblage of rare trees and shrubs, admirably cultivated.

MAY, 1910.

The only other cultivated Cornels with which *C. florida* is likely to be confused are *C. Nuttallii*, Audub., figured at plate 8311 of this work, and the Japanese *C. Kousa*, Buerg. The former is distinguished by the flower-heads not being enclosed by the involucre during winter, and by the usually more numerous bracts with acute, but not deflexed, apices. *C. Kousa* differs from both in its smaller ovate-lanceolate, acuminate bracts, and in its smaller leaves.

The bark of *C. florida*, officinally known as "Dogwood Bark," yields cornine, a bitter principle which has astringent, tonic and stimulative properties. It was at one time valued, especially in America, in intermittent fevers.

Cornus florida is unlikely to occupy an important place in English gardens, except, perhaps, in the more favoured ones of the south and west. In Ireland, South Wales and in the west of Scotland it ought to succeed in many places; and in those favoured regions few more beautiful shrubs can be grown. At Kew it succeeds only under protection. Mr. Chambers informs us that his plant of var. *rubra* is now 10 ft. high and 8½ ft. through, and that it is much more floriferous and lasts a longer time than the ordinary white-"flowered" type. It is grown in open sandy loam fully exposed to the sun.

DESCRIPTION.—*Tree*, of bushy habit, occasionally 40 ft. high in a wild state, usually a wide-spreading bush less than 15 ft. high under cultivation. *Young branches* terete, glabrescent, tinged with red. *Leaves* broadly elliptic or ovate, pubescent on both surfaces, especially beneath, 3–5 in. long, 1½–3 in. wide, dark green above, pale and glaucescent beneath, with a short acuminate apex. *Involucre* terminal, forming in autumn and enclosing the flower-head during winter, expanding in spring, reaching its fullest beauty in May, when it has become 3–4½ in. across. *Bracts* 4, petal-like, obcordate, 1¼–2 in. long, 1 in. wide, parallel-veined, bright rosy red, apex notched and decurved. *Flowers* 3 lin. long, produced in a crowded head ½ in. across. *Calyx-lobes* 4, pubescent, obtuse. *Corolla-lobes* 4, ligulate, pubescent, green, tipped with yellow. *Style* columnar, with a truncate stigma. *Fruit* an ovoid drupe ½ in. long, red when ripe; flesh thin, mealy; stone containing one or two seeds.

Fig. 1, flowers; 2, section of calyx and pistil; 3 and 4, anthers:—*all enlarged.*

M.S. del. J.N. Fitch lith.

Vincent Brooks, Day & Son Lt^d imp

Tab. 8316.

ACANTHOPANAX Henryi.

West China.

Araliaceae. Tribe Scheffleréae.

Acanthopanax, *Miq.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 398; *Harms in Engl. & Prantl, Nat. Pflanzenf.* vol. iii. pars 8, p. 49.

Acanthopanax Henryi, *Harms in Engl. & Prantl, Nat. Pflanzenf.* vol. iii. pars 8, p. 50; *Hemsl. in Journ. Linn. Soc.* vol. xxxvi. p. 451; *C. K. Schneider, Ill. Handb. Laubholzk.* vol. ii. p. 424; affinis *A. leucorrhizo*, Harms, sed foliolis supra scaberulis infra (saltem ad nervos) subvillosulis acutis vel breviter acuminatis minute dentatis, pedunculis pedicellisque robustioribus brevioribus distincta.

Frutex 2 m. vel ultra altus; rami citissime glabrati, aculeis e basi longitudinaliter elongata subito conicis compressis saepe recurvis armati. *Folia* 5-, raro 3-foliolata; petiolus 3–5·5 cm. longus, primo magis minusve villosulus, deinde praeter apicem glabratus; foliola oblanceolata vel late lanceolato-ovata, acuta vel breviter acuminata, basi saepe cuneatim in petiololum 3–6 mm. longum attenuata, integra vel saepius a medio arcte minuteque (rarius magis conspicue) dentata, intermedium 6–12 cm. longum, 2·5–3 (rarius 4) cm. latum, supra saturate viridia, scaberula, infra pallidiora, magis minusve (imprimis ad nervos) villosula, nervis utrinque circiter 7. *Umbellae* ad apices ramorum subumbellatim congestae; terminalis caetera longe praecedens, multiflora, densa, 1·5–3 cm. diametro, pedunculo robusto subglabro vel villosulo vel subtomentoso, 2·5–3·5 cm. longo suffulta; pedicelli sub anthesi 9–12 mm. longi, eodem indumentum ac pedunculi induti, inarticulati. *Ovarium* glabrum vel magis minusve villosulum, obovoideum, sub anthesi 1–2·5 mm. longum; discus 1·5–2·5 mm. diametro. *Petala* ovarium aequantia vel subaequantia. *Styli* florum fertilium 1·5–2·2 mm. longi, connati: stigmata punctiformia. *Baccae* demum nigrae, globosae, 9–10 mm. diametro.—*Eleutherococcus Henryi*, Oliv. in Hook. Ic. Pl. xviii. t. 1711; Hemsl. in Journ. Linn. Soc. vol. xxiii. p. 341.—O. Stapf.

The *Acanthopanax* here figured was first discovered in Hupeh, Central China, by Mr. A. Henry, and was introduced to cultivation by Messrs. J. Veitch & Sons through their collector, Mr. E. H. Wilson. From one of the plants raised by Messrs. Veitch in their nursery at Coombe Wood and obtained from them for the Kew collection in 1905,

the material for our illustration has been taken. This plant is now 5 ft. high and as much through, with stout, straight thorny branches and of sturdy rather than graceful habit. As a shrub for gardens it is, on the whole, more curious than beautiful; at the same time, the foliage is handsome and the globose heads of inky black fruits are striking. The leaflets are variable as regards shape and degree of pubescence. The flowers are not particularly attractive; they do not appear, as a rule, until August and September. The fruits ripen in October and continue until Christmas. The plant succeeds well in ordinary loamy soil and may safely be deemed hardy. The bark of the root is employed in China as a drug.

DESCRIPTION.—*Shrub*, 5 ft. or more in height, branches soon becoming glabrous, armed with flattened, abruptly conical often recurved thorns with longitudinally expanded bases. *Leaves* 5-, rarely 3-foliolate; petiole 1½–2 in. long, at first more or less puberulous, soon becoming glabrous except near the tip; leaflets oblanceolate or wide lanceolate-ovate, acute or shortly acuminate, often narrowed at the base into a petiolule 2–3 lin. long, entire or often from the middle onwards closely finely serrate, occasionally more conspicuously toothed, the central 1½–5 in. long, 1–1¼, rarely 1¾ in. wide, deep green and scaberulous above, paler and more or less pubescent especially in the nerves beneath; lateral nerves about 7 on each side. *Umbels* clustered at the ends of the branches, the terminal much larger than the others, many-flowered, dense, ½–2¼ in. across; peduncles stout, almost glabrous or pubescent or somewhat tomentose, 1–1½ in. long; pedicels in flower 4–6 lin. long, with the same degree of pubescence as their peduncles, never articulate. *Ovary* glabrous or more or less pubescent, obovoid, in flower ½–1¼ lin. long; disk ¾–1¼ lin. across. *Petals* almost or quite as long as the ovary. *Styles* of the fertile flowers ¾–1 lin. long or slightly longer, connate; stigmas minute. *Berry* black, globose, 4–5 lin. in diameter.

Fig. 1, male flower; 2, calyx and pistil of a hermaphrodite or female flower with short styles; 3, section of a female flower; 4, calyx and pistil of a hermaphrodite or female flower with long styles; 5, a pyrene; 6, section of the same; 7, embryo:—*all enlarged*.

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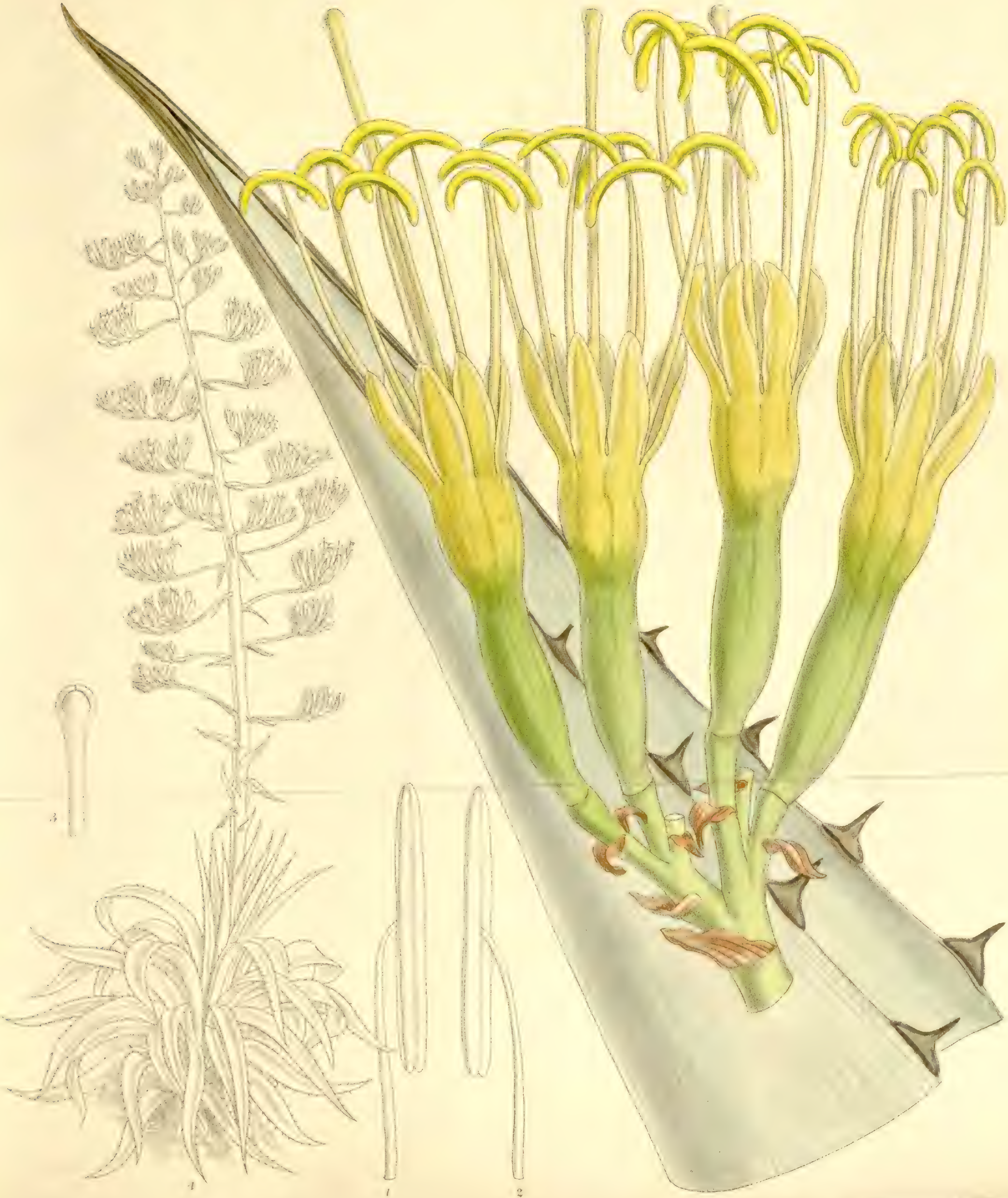

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TAB. 8317.

AGAVE FRANZOSINI.

Mexico or Central America.

AMARYLLIDACEAE. Tribe AGAVEAE.

AGAVE, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 733.

Agave (Euagave) **Franzosini,** *Nissen in Hort. ex Ricasoli, Della Utilita dei Giardini d'Acclimazione* (1888), p. 7 (nomen); *Sewell in Gard. Chron.* 1889, vol. vi. p. 69; *W. Wats. in Kew Bull.* 1889, p 301; *Bak. in Kew Bull.* 1892, p. 3, et *in Gard. Chron.* 1892, vol. xii. p. 179, fig. 31; *Berger in Gartenwelt*, 1898, vol. ii. p. 603, c. icon.; species ex affinitate *A. Verae Crucis*, Mill., sed differt foliis numerosioribus majoribus glaucissimis asperrimis, paniculaque magis elongata.

Acaulis, rosula maxima, stolonifera. *Folia* circiter 40, magna, erecta eleganter recurvata, 2·25 m. longa, oblanceolata, superne canaliculata, rigida sed parum carnosa, saepe ad margines undulata vel varie flexa, basin versus sensim attenuata et carnosiora, subtus valde convexa, supra medium 35–41 cm. lata, sensim acuminata et in spinam validam conicam 6–7 cm. longam atro-brunneam breviter decurrentem abeuntia, glaucissima, sub sole aestivo albida vel caesia, utrinque asperrima et basin versus zonis vel arcis viridibus laevibus irregulariter maculata, ad margines parum sinuatos aculeis magnis atro-brunneis remotiusculis deltoideo-uncinatis vel patulis 1–2 cm. longis armata. *Inflorescentia* maxima, 11·5 m. alta; scapus validus basi 27 cm. diametro, 2·75 m. longus, glaucus, bracteis vacuis inferioribus foliaceis superioribus deltoideis subulato-acuminatis munitus; panicula 8·75 m. longa, 2·9 m. lata, oblonga, ramis numerosis patentibus viridibus superne repetite trichotome divisis flores numerosos gerentibus; bracteae parvae, deltoideae, reflexae; pedicelli 1–2 cm. longi. *Perianthii* segmenta basi in tubum ventricoso-infundibuliformem 22 mm. longum extra flavescentem continuata, superne libera, aurea, mox siccantia, 32 mm. longa; exteriora superne linearia, obtusa, planiuscula, interiora dorso carinata intus canaliculata. *Stamina* ad medium tubi affixa; filamenta flavescentia, robusta, 8 cm. longa; antherae sulfureae, 4 cm. longae. *Ovarium* 5 cm. longum, 3(–6)-gonum, laete et nitide viride, basin versus attenuatum, superne 13 mm. latum; stylus robustus trigonus, demum 12 cm. longus; stigma capitatum, obscure trilobum.—A. BERGER.

The *Agave* which forms the subject of our illustration, which Mr. J. G. Baker terms "the prince of the Agaves," is certainly one of the noblest members of the genus. very distinctive whitish or bluish colour which shows to much advantage in strong sunlight, the vigour of its growth and the grace of its habit combine to render it a striking and delightful object. It is not certainly known whether its original home be Central America or Mexico, but it almost certainly came from one or other of these

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areas, and Mr. Vicenzo Ricasoli, in the place quoted above, gives Mexico as its home. It appears to have been introduced to Italy in the first instance by Mr. Francesco Franzosini, in whose fine garden at Intra on Lago Maggiore there were plants prior to 1878, the year in which it was added by the late Sir T. Hanbury to his collection at La Mortola, where it flowered for the first time in 1889. Since then it has flowered repeatedly there, has always produced abundant seed, and has been widely distributed. It was first added to the collection of Agaves at Kew in 1890, when Sir T. Hanbury sent seeds to this establishment, which in 1892 was further indebted to the same generous correspondent for a living plant.

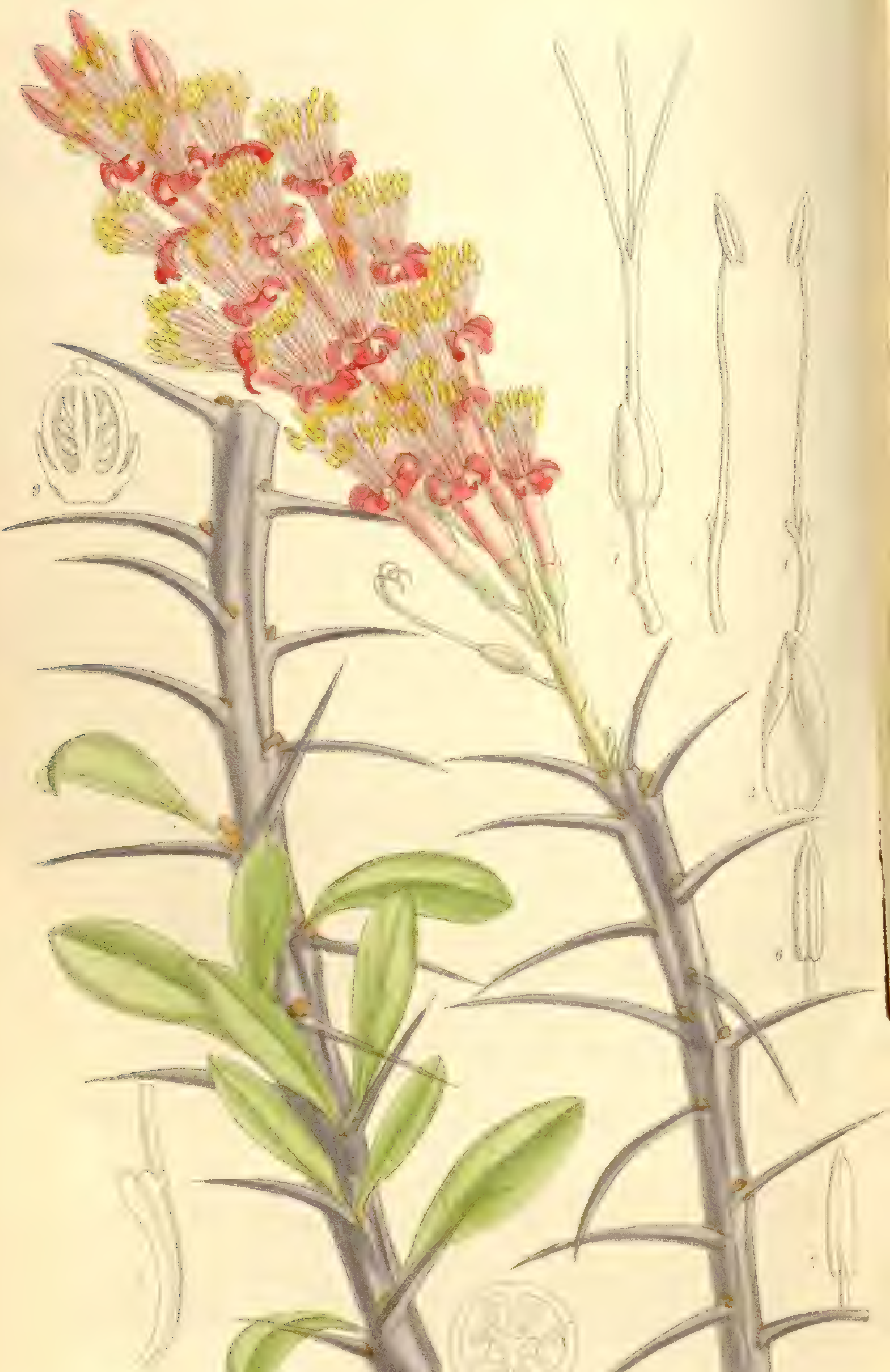
The plant from which the material employed in preparing our plate was obtained was a magnificent specimen in the garden at La Mortola, whose age was not much over 15 years. At the end of April it showed no sign of flowering, but in the middle of May the enormous peduncle began to appear, and, growing with great rapidity, reached its full size in about six weeks; the first flowers began to open on the lowest branches on July 21st, and a fortnight later the material for our plate was available.

A. Franzosini is easily propagated by suckers which soon grow into sturdy plants under the treatment suitable for *A. Vera Cruz*, and appears to be as hardy as that species. At La Mortola it seems to prefer the hottest situations; it requires as much light as possible, and should not be kept at all damp, otherwise it is apt to become less glaucous and to lose much of its distinctive beauty. At Kew *A. Franzosini* thrives well under the treatment suitable to its nearest allies.

DESCRIPTION.—*Stem* 0; rosette very large, in full-grown examples 15 ft. wide and 10–11 ft. high, with about 40 somewhat recurved and gracefully bent, whitish or bluish-white leaves and many suckers. *Leaves* about 7½ ft. long, 5–6 in. thick at the base, convex on both sides, but especially beneath, and there narrowed, 6½ in. wide, thence gradually becoming wider and thinner upwards, oblanceolate and 14–16 in. across when flattened out, but generally broadly and deeply channelled while still young and erect, the margins at times wavy, the apex ending in a strong conical subulate blackish-brown end-spine 2¼–3 in. long, decurrent on the margins for 4–8 in.; the margins lower down bordered with spines and slightly or hardly repand between the spines; those lowest down rather small and close set, 3 lin. long and 8 lin. apart, deltoid uncinate, the next above larger, and ¾–1 in. apart; the upper spines about the middle of the leaf 2 in. apart, and sometimes with one or two smaller ones between them, deltoid-uncinate, recurved or spreading from a wide fleshy base, above the middle still larger, about ¾ in. long, and from a more repand margin; those near the tip standing as far apart, but again smaller; all blackish brown; upper leaves in a flowering rosette shorter and narrower, the highest linear-lanceolate with a straight margin and sometimes with a continuous horny border; both surfaces rough and whitish, but irregularly marked with small green patches or stripes, especially underneath. *Inflorescence* almost 40 ft. high; scape stout, about 9 ft. long and 11 in. thick, with several empty bracts, the lowest leafy, the upper scaly, triangular with a subulate tip; panicle oblong or cylindric-ovate, about 10 ft. across; branches spreading, the lowest shortest, with small deltoid basal bracts, 2–3 times 3-furcate upwards, many-flowered; pedicels 5–10 lin. long; bracts very small, deltoid; flowers over 4 in. (including the style over 7 in.) long. *Perianth-segments* united below in a globose or wide funnel-shaped tube; above free, linear, obtuse, soon withering, brightish yellow; the outer flat, 1¼ in. long, the inner narrower, keeled without and channelled within. *Stamens* attached near the middle of the tube; filaments stout, yellowish, 3 in. long; anthers sulphur yellow, 1½ in. long. *Ovary* somewhat clavate, 3(–6)-angled, smooth, bright green, 2 in. long, narrowed at the apex; style very stout, 4½ in. long; stigma thickened, obscurely 3-lobed.

Figs. 1 and 2, anthers; 3, stigma; 4, whole plant, showing habit:—1–3 *enlarged*, 4 *much reduced.*

8316



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TAB. 8318.

FOUQUIERIA SPLENDENS.

Northern Mexico and South-Western United States.

FOUQUIERACEAE.

FOUQUIERIA, *H. B. K.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 161; *Engl. & Prantl, Natürl. Pflanzenfam.* vol. iii. p. 298; *Nachtr.* i. p. 251, ii. p. 228.

Fouquieria splendens, *Engelm. in Wisl. Mem. Tour Mex.* p. 98; *Nash in Bull. Torr. Bot. Club,* vol. xxx. p. 456; a speciebus caeteris filamentis supra basin squama munitis distincta.

Frutex spontaneus 2–6 m. altus, glaber, a basi parce ramosus, ramis ad 2·5 cm. crassis fere rectis spinosis sulcatis cortice laevi fusco vel aetate cinerascente obtectis. *Folia* ramorum longorum obovato- vel oblanceolato-oblonga, obtusa vel subacuta, basi in petiolum perbrevem attenuata, 2–3 cm. longa, 0·5–1 cm. lata, ramorum abbreviatorum fasciculata, minora; petiolus costaeque pars maxima demum induratus, persistens, spinam 1–2·5 cm. longam patulam sistens. *Inflorescentiae* terminales—raro una alterave axillaris, paniculatae, angustae, 10–15 cm. longae, saepe multiflorae, ramis brevibus plerumque ad fasciculos florum reductis, interdum fere omnibus unifloris; bracteae scariosae, caducae; pedicelli ad 5 mm. longi, saepe breves. *Sepala* late ovata vel suborbicularia, obtusissima, 5–8 mm. longa, pallida, margine hyalino. *Corolla* rubra; tubus rectus, superne sensim paulo ampliatus, 10–16 mm. longus; lobi late ovati vel suborbiculares, obtusi, recurvi vel revoluti, 4–5 mm. longi. *Stamina* 15, filamentis exsertis inaequilongis supra basin paulo dilatatis et intus squamula biloba extra pilosa instructis; antherae 4 mm. longae, connectivo apiculato. *Styli* magis minusve alte coaliti. *Capsula* 10–18 mm. longa, valvis crustaceis. *Semina* 7–8 mm. longa, alba, ala mox in pilos soluta basi ad 2 mm. lata circumdata.—O. STAPF.

The genus *Fouquieria*, established in 1823 by Bonpland and Kunth, was five years later treated by the elder De Candolle as the type of a distinct natural family. In taking this step, De Candolle in reality only endorsed a view already suggested by the authors of the genus. Since then the affinities and the systematic status of *Fouquieria* have been carefully studied by several able taxonomists, whose conclusions have not always been in accord. One point which emerges from the discussion as indisputable is that the genus occupies a singularly isolated position. Having regard to this fact, and to the consideration that its relationships are by no means clear, it is more satisfactory to treat *Fouquieria* as the representative of an independent family.

The species here figured, *F. splendens*, extends westwards from N.W. Texas through New Mexico and Arizona to Southern California, thence southwards to Lower California and the Mexican states of Coahuila, Chihuahua and Sonora. In the northern part of this area the plant is variously known as the Coach Whip, the Vine Cactus, Jacob's Staff; its Mexican name is the Ocotello. The bark contains a gum and a resin, and yields, in addition, the substance known as Ocotello Wax. It makes an effective and almost impenetrable hedge, and, according to Dewey, it is sometimes planted closely in line around a rectangle 10 ft. long and 5 across; an opening is left at one end, a covering of brush is laid on top, and the result is a hut such as Mexican families of the poorest class inhabit.

The material from which our figure has been prepared was communicated by Mr. F. W. Moore from a specimen in the Glasnevin collection. That plant is about 3 ft. in height, sparingly branched and strongly armed with stout thorns. The few roots are strong and woody; the small, thin and delicate leaves are deciduous; the indication therefore is that the plant does not require much water or a moist atmosphere. It thrives well and is vigorous at Glasnevin in the Cactus house, in partial shade, with a minimum night temperature of 50°–52° F.; it is grown in an 8-in. pot in loam, mixed with one-fifth finely broken potsherds and old mortar. In the growing season, March to October, it requires a fair amount of water, and has occasionally to be syringed; during the dull winter months it needs very little water, and the atmosphere has to be kept dry so as to provide the marked period of rest which the plant demands.

DESCRIPTION.—*Shrub*, in a wild state 6–20 ft. high, sparingly branched from the base, branches up to 1 in. thick, nearly straight, armed with spines, channelled and covered with smooth, at first tawny, at length ash-grey bark. *Leaves* of the long branches obovate- or oblanceolate-oblong, obtuse or subacute, narrowed at the base to a very short petiole, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, 3–5 lin. wide; those of the short branchlets fascicled and smaller, their petioles and midribs ultimately hardening into long spreading persistent spines $\frac{1}{3}$–1 in. long. *Inflorescences* usually terminal, casually one or more axillary, panicled, narrow, 4–6 in. long, generally many-flowered, on the short branches often reduced to fascicles of flowers, or sometimes almost all to single flowers; bracts scarious, caducous; longest pedicels 2–3 lin. long, often quite short. *Sepals* wide ovate or nearly orbicular, obtuse, 2½–4 lin. long, pale with hyaline margin. *Corolla* red; tube straight, slightly widened upwards, 5–8 lin. long; lobes wide ovate or nearly orbicular, obtuse, recurved or revolute, 2–2½ lin. long. *Stamens* 15, filaments exserted, unequal, slightly widened above the base and bearing there on the inner aspect a 2-lobed scale which is hirsute on the outer side; anthers 2 lin. long; connective apiculate. *Styles* more or less connate from below upwards. *Capsule* 5–9 lin. long, valves crustaceous. *Seeds* 3½–4 lin. long, white, surrounded by a wing 1 lin. wide at the base, which soon breaks up into a fringe of hairs.

Fig. 1, calyx and pistil; 2, sepal; 3 and 4, stamens; 5, base of a filament; 6 and 7, anthers; 8 and 9, transverse and vertical sections of an ovary:—*all enlarged.*

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TAB. 8319.

KALMIA CUNEATA.

Carolina.

ERICACEAE. Tribe RHODOREAE.

KALMIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 596.

Kalmia cuneata, *Michx, Fl. Bor. Amer.* vol. i. p. 257; *Nuttall, Gen. North Amer. Pl.* vol. i. p. 267; *Sargent in Garden & Forest,* vol. viii. p. 434, fig. 60; affinis *K. angustifoliae,* Linn., sed foliis alternis (nec verticillatis) basi cuneato-attenuatis vix petiolatis et subtus pilis glanduliferis obsitis facile distinguitur.

Frutex ad 1 m. altus, ramis junioribus glanduloso-puberulis rubris demum glabris et atro-brunneis. *Folia* alterna, 2–5 cm. longa, 0·5–1·6 cm. lata, lanceolata vel oblanceolata, acuta vel obtusa, basi cuneato-attenuata, sessilia vel vix petiolata, supra glabra, atroviridia, subtus pilis minutis glanduliferis conspersa, pallide viridia, decidua. *Flores* fasciculati, fasciculis 2–6-floris infra foliis aggregatis. *Pedicelli* 1·5–2 cm. longi, filiformes, pilis glanduliferis conspersi. *Calyx* profunde 5-lobus, glaber, viridis, rubro-marginatus; lobi 2·5 mm. longi, oblongi, obtusi, apiculati, marginibus reflexis. *Corolla* 1–1·5 cm. diametro, late cupuliformis, breviter 5-loba, basi 10-gibbosa, glabra, extra lineis 5 glanduloso-pubescentibus, alba, fundo annulatim punctis rubris notata; lobi late deltoideo-ovati, subacuti. *Stamina* 10, filamentis basi pubescentibus. *Ovarium* subglobosum, basi 10-sulcatum, pilis minutis glanduliferis dense obtectum; stylus 6–6·5 mm. longus, glaber. *Capsula* 6 mm. diametro, valvis 5 dirupta.—N. E. BROWN.

The beautiful shrub here figured was originally discovered in South Carolina by Michaux prior to 1803, and was again met with by Nuttall in the same region, in swamps between Camden and Statesville, some time before 1818. Nuttall found it also near Newbern in North Carolina, but this very rare plant, which seems to be confined to Carolina, appears never to have been gathered, after Nuttall's time, until Mr. W. W. Ashe, of the State Geological Survey, met with it in a pine-barren swamp between the Cape Fear and Back rivers, some ten miles to the north-west of Whitehall in North Carolina, during the winter of 1893–94. In the summer of 1894 it was introduced, from this locality, into the collection of Mr. G. W. Vanderbilt at Baltimore, where it flowered in June, 1905. Since then this *Kalmia* has been collected in swamps in Bladen county, North Carolina. The plant from which the figure of *K. cuneata* now given

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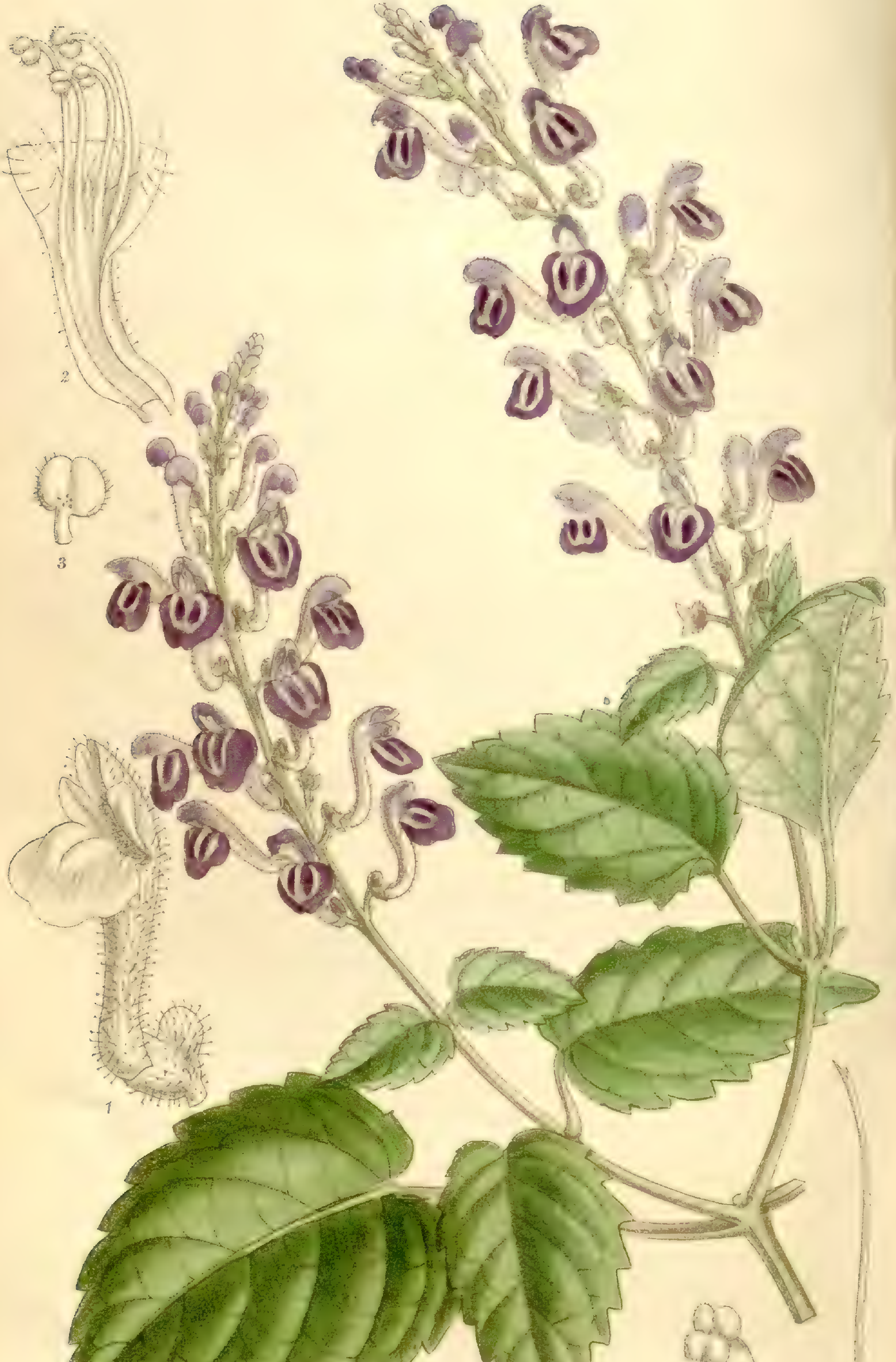
has been prepared is one of a large batch raised from seed presented to Kew, in January, 1904, by Professor Sargent of the Arnold Arboretum. The species, so far as can be judged from the experience of the past five winters, promises to be quite hardy. It has an erect habit, and flowers in July from the upper portion of the preceding year's growth. At Kew it grows very well in the soil used for Ericaceous plants generally; a sandy loam, devoid of calcareous matter, to which a proportion of peat has been added. Grown in a mass, *K. cuneata* produces a very pleasing effect; it is, moreover, useful on account of its flowering so late in the season, when comparatively few shrubs remain in blossom.

DESCRIPTION.—*Shrub*, 3–4 ft. high, young branches glandular-hairy and red, ultimately glabrous and dark brown. *Leaves* alternate, $\frac{3}{4}$–2 in. long, $\frac{1}{5}$–$\frac{1}{2}$ in. wide, lanceolate or oblanceolate, acute or obtuse, cuneately narrowed at the base, sessile or very shortly petioled, glabrous and dark green above, beneath paler and with scattered minute glandular hairs, deciduous. *Flowers* clustered in fascicles of 2–6 below the leaves; pedicels filiform with scattered glandular hairs. *Calyx* deeply 5-lobed, glabrous, green with red margins; lobes $1\frac{1}{4}$ lin. long, obtuse, apiculate, the margins reflexed. *Corolla* 5–8 lin. across, widely cup-shaped, shortly 5-lobed, 10-gibbous at the base, glabrous except for 5 lines of glandular hairs outside, white, with a ring of red dots at the base; lobes widely deltoid-ovate, somewhat acute. *Stamens* 10, filaments pubescent at the base. *Ovary* subglobose, 10-grooved at the base, closely covered with minute glandular hairs; style about 3 lin. long, glabrous. *Capsule* 3 lin. wide, dehiscing by 5 valves.

Fig. 1, a flower; 2, the same, corolla and stamens removed; 3 and 4, stamens; 5, ovary:—*all enlarged.*

8320



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TAB. 8320.

SCUTELLARIA VIOLACEA.

India and Ceylon.

LABIATAE. Tribe STACHYDEAE.

SCUTELLARIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1201.

Scutellaria violacea, *Heyne ex Wall. Pl. As. Rar.* vol. i. p. 66; *Benth. Lab. Gen. et Sp.* p. 429, et *in DC. Prodr.* vol. xii. p. 418; *Wight, Ic. Pl. Ind. Or.* vol. iv. t. 1449; *Thwaites, Enum. Pl. Zeylan.* p. 239; *Hook. f. Fl. Brit. Ind.* vol. iv. p. 668; *Trimen, Hand-Book Fl. Ceylon*, vol. iii. p. 382; *Gard. Chron.* 1904, vol. xxxv. p. 389; species *S. discolori*, Colebr., affinis, sed foliis saepissime ovatis et racemis brevioribus floribus oppositis facile distinguenda.

Herba perennis, e basi ramosa. *Caules* graciles, erecti, usque ad 6 dm. alti, puberuli, parce ramosi, internodiis 3–4·5 cm. longis. *Folia* ovata, 4–8 cm. longa, 3–5 cm. lata, subacuta vel breviter acuminata, basi cordata vel rotundata, sat grosse crenata vel interdum serrato-dentata, supra fere glaberrima, infra praesertim in venis primariis puberula, tenuia; petiolus gracilis, 3–6 cm. longus, breviter pubescens. *Racemi* terminales, graciles, 9–15 cm. longi, multiflori, saepe secundi, rhachide et pedicellis breviter glanduloso-pubescentibus. *Bracteae* ellipticae, obtusae, pedicelli dimidio leviter longiores. *Flores* solitarii, oppositi, paribus circiter 1 cm. disjunctis. *Pedicelli* 2–3 mm. longi. *Calyx* circiter 3 mm. longus, post anthesin valde accrescens, glanduloso-pubescens, labiis brevissimis latis superioris dorso squama lata 1·5–2 mm. longa postice alte concava praedito. *Corolla* circiter 1·8 cm. longa, violacea, labio inferiori macula alba notato; tubus sat tenuis, basi valde curvatus, faucem versus gradatim dilatatus; labium superius circiter 5 mm. longum, trilobatum, lobo intermedio maximo emarginato; labium inferius subintegrum vel obscure lobatum, suborbiculare, 6–8 mm. longum latumque. *Stamina* infra galeam inclusa; antherarum loculi lateraliter breviter ciliati. *Discus* antice valde gibbosus, superne parce glandulis sessilibus instructus. *Nuculae* obovoideae, minute tuberculatae.—*S. indica*, Roxb. Hort. Beng. 45, et Fl. Ind. vol. iii. p. 24, non Linn. *S. floribunda*, Benth. in DC. Prodr. vol. xii. p. 418.—S. A. SKAN.

Scutellaria violacea, the species now figured, has been in cultivation at Kew since 1900, when plants were raised from seeds received from the Botanic Garden at Hakgala, Ceylon. The nearest allies in the genus are *S. discolor*, Colebr., also an Indian species, and *S. indica*, Linn., which, in spite of its name, is a Chinese plant. The former is, as a rule, readily distinguished from *S. violacea* by the fact that its flowers are almost always scattered on the rachis, whereas in all the forms referred to *S. violacea* they are opposite. The latter, which agrees with *S. violacea* in having opposite flowers, appears to be always smaller in stature, in leaves and in flowers. In the wide sense in which *S. violacea* is taken in the Flora of British India the species extends from the Nilgiri Hills in the Indian Peninsula, at elevations up to 7000 ft., southwards to Ceylon, and is represented in the Eastern Himalaya by a distinct variety. Even in its southern area, however, the variability in stature, in the hairiness and texture of the leaves, and in the size of the flowers is such that Sir Joseph Hooker recognises there three other varieties, all of which have at times been treated as distinct species. The form here depicted, which appears to be typical *S. violacea*, as cultivated at Kew, forms a fairly compact plant about a foot and a half in height, which flowers freely in a warm house about midsummer. As a pot plant it is most satisfactory when raised from cuttings every year, and when grown under the conditions suitable for the well-known *S. javanensis*, Jungh., and *S. Ventenatii*, Hook.

DESCRIPTION.—*Herb*, perennial, branching from the base. *Stems* slender, erect, 1½–2 ft. high, puberulous, sparingly branching, the internodes 1¼–1¾ in. long. *Leaves* ovate, 1½–3 in. long, 1¼–2 in. wide, subacute or shortly acuminate, base cordate or rounded, rather coarsely crenate or at times serrately toothed, almost glabrous above, puberulous beneath, more especially along the main-nerves, thin; petiole slender, 1¼–2¼ in. long, shortly pubescent. *Racemes* terminal, slender, 3½–6 in. long, many-flowered, often secund, the rachis and pedicels shortly glandular-pubescent; bracts elliptic, obtuse, hardly as long as the pedicels. *Flowers* solitary, opposite, the pairs about 5 lin. apart; pedicels 1–1½ lin. long. *Calyx* about 1½ in. long, much enlarged after flowering, glandular-pubescent, lips very short and broad, the upper with a broad dorsal scale ¾–1 lin. long, deeply concave behind. *Corolla* about ¾ in. long, violet with white blotches on the lower lip; tube rather slender, much curved below, gradually widening to the throat; upper lip about 2½ lin. long, 3-lobed, the central lobe largest, emarginate; lower lip suborbicular, nearly entire or obscurely lobed, 3–4 lin. across. *Stamens* hidden under the hooded upper lip; anther-cells shortly ciliate on the sides. *Disk* distinctly gibbous in front, sparingly beset above with sessile glands. *Nutlets* obovoid, minutely tubercled.

Fig. 1, flower; 2, corolla-tube laid open, showing staminal insertion; 3, anther; 4, style; 5, ovary and disk:—*all enlarged*.

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TAB. 8321.

CIRRHOPETALUM BIFLORUM.

Java.

ORCHIDACEAE. Tribe EPIDENDREAE.
CIRRHOPETALUM, *Lindl.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 504.

Cirrhopetalum biflorum, *J. J. Smith in Ic. Bogor.* vol. ii. t. 120, fig. B; species *C. picturato*, Lodd., proxima a quo scapis gracilibus multo brevioribus et bifloris, sepalis lateralibus longe attenuatis valde differt.

Herba epiphytica. *Rhizoma* repens, gracilius. *Pseudobulbi* aliquatenus distantes, ovato-oblongi, tetragoni, circiter 3–4 cm. longi, monophylli. *Folia* subsessilia, lanceolata vel oblongo-lanceolata, subobtusa, coriacea, basi attenuata, 12–15 cm. longa, 2–2·5 cm. lata. *Scapi* graciles, suberecti, 8–10 cm. longi, basi vaginis lanceolatis paucis obtecti, apice biflori. *Bracteae* ovato-lanceolatae, acuminatae, concavae, circiter 1 cm. longae. *Pedicelli* patentes vel decurvi, circiter 3 cm. longi. *Flores* magni, speciosi, purpureo-punctati. *Sepalum* posticum elliptico- vel lanceolato-oblongum, concavum, longe setiferum; limbus circiter 2 cm. longus, seta 1 cm. longa, saepe incurva; sepala lateralia lineari-lanceolata, longissime attenuata, 8–9 cm. longa, decurva. *Petala* oblongo-lanceolata, brevissime tridentata, eciliata, circiter 6 mm. longa, dente medio interdum setifero. *Labellum* recurvum, ovato-oblongum, subobtusum, carnosum, eciliatum, circiter 8 mm. longum. *Columna* brevis, lata, edentata, basi in pedem attenuatum incurvum producta.—*Bulbophyllum biflorum*, Teijsm. et Binn. in Nederl. Kruidk. Archief. vol. iii. (1855) p. 397; Miq. Fl. Ind. Bat. vol. iii. p. 647; Reichb. f. in Walp. Ann. vol. vi. p. 262; J. J. Smith, Orch. Jav. p. 469.—R. A. ROLFE.

A native of the mountains of Java, to which island it appears to be confined, this distinct species, which was discovered by Teijsmann and Binnendijk, and described by them more than half a century ago, long remained practically unknown in Europe, and has but recently been introduced to cultivation. The plant from which the figure now given has been prepared was presented to Kew in 1908 by the Hon. W. Rothschild, Tring, and flowered in the tropical orchid collection in June, 1909. *C. biflorum* is, perhaps, most nearly allied to *C. picturatum*, Lodd. (Bulbophyllum picturatum, *Reichb. f.*), a native of Tenasserim, figured at t. 6802 of this work, but is very easily distinguished by the characters noted by Mr. Rolfe. The most striking feature in our plant is the constantly 2-flowered scape, to which it owes its name, and on account of which it serves as a link between the group of forms with solitary flowers, referred to at t. 8199, and those species that possess the umbellate inflorescence at one time thought characteristic of the genus. The difficult question as to whether the genus *Cirrho-*

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petalum, proposed by Lindley, can be upheld, is one that has already been alluded to in these pages. The other leading feature in a normal *Cirrhopetalum* is the elongation of the lateral sepals, which, moreover, are perfectly united. This character, like that of an umbellate inflorescence, also breaks down, for species occur that serve to link forms like the present, in which the elongation is pronounced, with typical *Bulbophylla*, where the lateral sepals hardly exceed the upper. But the difficulty thus created is only a technical one. It no doubt fully justifies the union of *Cirrhopetalum* and *Bulbophyllum*, if the question be considered from a purely formal standpoint. When, however, regard is had to the fact that such intermediate forms are few in number, and to the consideration that if these be left out of account it is impossible to mistake a *Cirrhopetalum* for a *Bulbophyllum*, it is more convenient to adopt, as Mr. Smith in this case has done, the usage that prevails among growers of orchids generally. *C. biflorum* thrives well at Kew planted in a teak basket in sphagnum moss and osmunda fibre; it requires to be kept in a moist condition during the period of active growth.

DESCRIPTION.—*Herb*, epiphytic. *Rhizome* creeping, rather slender. *Pseudobulbs* somewhat distant, ovate-oblong, tetragonous, about 1¼–1½ in. long, monophyllous. *Leaves* subsessile, lanceolate or oblong-lanceolate, somewhat obtuse, coriaceous, narrowed to the base, 5–6 in. long, ¾–2 in. wide. *Scapes* slender, suberect, 3–4 in. long, clothed at the base with a few lanceolate sheaths, 2-flowered; bracts ovate-lanceolate, acuminate, concave, about 5 lin. long. *Flowers* large, showy, purple-dotted; pedicels spreading or decurved, about 1¼ in. long. *Sepals*, upper elliptic- or lanceolate-oblong, concave, with a long seta, its limb about 10 lin. long, the seta 5 lin. long; lateral linear-lanceolate, much attenuate, 3–3½ in. long, decurved. *Petals* oblong-lanceolate, very shortly 3-toothed, about 3 lin. long, without setae or with the mid-tooth occasionally ending in a seta. *Lip* recurved, ovate-oblong, somewhat obtuse, fleshy, without cilia, about 4 lin. long. *Column* short, broad, without teeth, base prolonged as a narrow incurved foot.

Fig. 1, flower with sepals removed; 2, lip; 3, column; 4, pollinia:—*all enlarged.*

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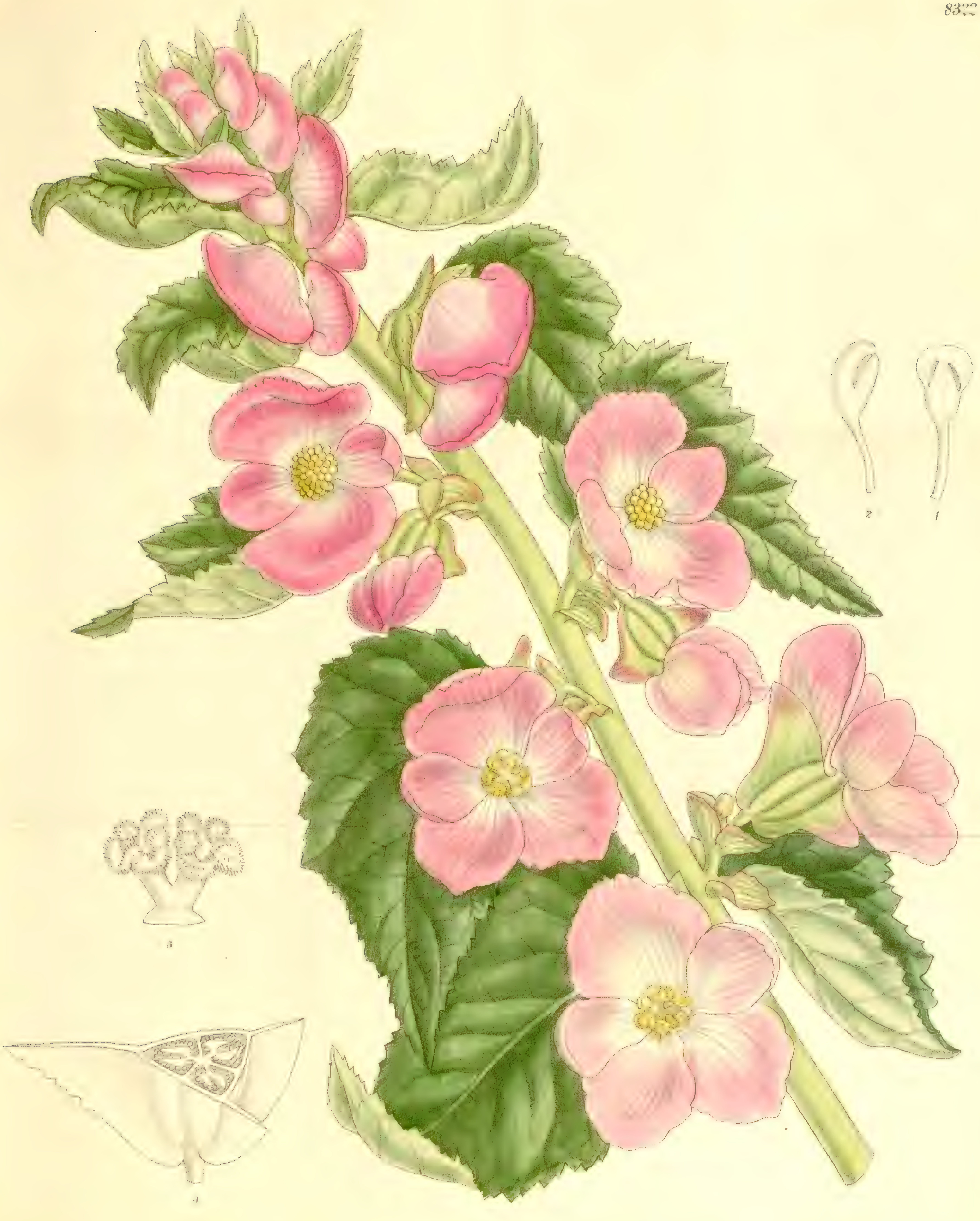

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TAB. 8322.

BEGONIA MARTIANA, var. GRANDIFLORA.

Mexico.

BEGONIACEAE.

BEGONIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 841.

Begonia (Knesebeckia) Martiana, *Link et Otto, Ic. Rar.* p. 49, t. 25; var. **grandiflora,** *Garnier in Ill. Hort.* sér. vi. vol. ii. p. 98, fig. 14; a forma typica floribus majoribus praesertim differt.

Herba terrestris, tuberosa, tubere ellipsoideo-oblongo carnoso circiter 5 cm. longo, caule 30–45 cm. alto, ramis erectis carnosis glabris foliosis. *Folia* petiolata, oblique cordata, subacuta, duplicato-crenata, glabra vel parce pilosa, 8–15 cm. longa, 5–8 cm. lata, petiolis 1–3 cm. longis; stipulae late ovatae, subintegrae. *Flores* bracteati bracteolatique, axillares, singuli vel fasciculati, magni, rosei, masculi 4-meri, feminei saepius 5-meri; bracteae foliaceae, supra gradatim minores et subconcavae; bracteolae late ovatae, obtusae, submembranaceae. *Sepala* suborbicularia, 2·5–3 cm. lata, subconcava. *Petala* suborbicularia, 1–1·5 cm. lata. *Stamina* numerosa, filamentis basi in columnam brevem connatis. *Styli* 3, basi connati, superne 2-fidi. *Capsula* 3-alata, alis inaequalibus crenulatis, apice stylis persistentibus coronata.—R. A. ROLFE.

The handsome Begonia which forms the subject of our plate is perhaps best considered a garden race of *B. Martiana*, Link and Otto, a native of Mexico, which the late Mr. A. de Candolle considered to be itself no more than a variety of *B. gracilis*, Kunth. The examination of a large series of specimens, however, has led Mr. Rolfe to take the view that the two are, on the whole, better treated as distinct species; *B. gracilis* is always a smaller plant than normal *B. Martiana*, with more slender and never strictly erect stems, while it has much more divided leaves and a different inflorescence. As thus separated *B. Martiana* is represented in gardens by three more or less readily distinguishable forms, known respectively as var. *grandiflora*, var. *pulcherrima* and var. *racemiflora*. They differ but slightly from each other and have all been familiar plants in Begonia collections during the past twenty years. All three are good garden plants, with stems sometimes reaching 2 ft. in height when well grown, though when they are small in size and weak in growth owing to having received unsuitable treatment, they are alike in bearing a close resemblance to *B. gracilis,* with which, as already remarked, their identity has been suggested. Of the three forms, that now figured from a plant which flowered in the Kew collection in July, 1909, is certainly the finest, and the extent to which selection has led, in this case, to the evolution of an improved garden race may perhaps be best estimated by a comparison of our illustration with that given, at plate 2966 of this work, of *B. diversifolia*, Graham, which is now recognised as being only a state of *B. Martiana.* Our plant grows well when kept in a frame or greenhouse and shaded from bright sunshine. The whitish, irregularly shaped tubers lie dormant from about October until the following April, when they develop several stems which grow rapidly and flower freely in July. The plants ripen seeds and also produce clusters of small bulbil-like buds—which may be used for propagation in place of seeds, in the axils of the leaves.

DESCRIPTION.—*Herb;* terrestrial; tuber ellipsoid-oblong, fleshy, about 2 in. long; stem 1–1½ ft. high; branches erect, fleshy, glabrous, leafy. *Leaves* petioled, obliquely cordate, somewhat acute, twice crenate, glabrous or sparingly hairy, 3–6 in. long, 2–3 in. wide; petioles ⅓–1¼ in. long; stipules wide ovate, almost entire. *Flowers* bracteate and bracteolate, axillary, solitary or clustered, large, rose-pink, the males 4-merous, the females usually 5-merous; bracts leafy, gradually diminishing upwards and subconcave; bracteoles wide ovate, obtuse, almost membranous. *Sepals* suborbicular, 1–1¼ in. wide, subconcave. *Petals* suborbicular, 5–8 lin. wide. *Stamens* many, their filaments connate below in a short column. *Styles* 3, connate below, 2-armed above. *Capsule* 3-winged, the wings unequal, crenulate; the apex tipped by the persistent styles.

Figs. 1 and 2, stamens; 3, stigma; 4, ovary, in cross-section:—*all enlarged.*

M S del. J.N.Fitch lith.

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TAB. 8323.

IRIS CLARKEI.

Sikkim.

IRIDACEAE. Tribe IRIDEAE.

IRIS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris Clarkei, *Baker, Handb. Irid.* p. 25 et *in Hook. f. Fl. Brit. Ind.* vol. vi. p. 275; *Dykes in Gard. Chron.* 1909, vol. xlvi. p. 15; affinis *I. Delavayi*, Mich., sed caule solido, foliis adultis minus rigidis parte superiore demissa, spathis magis herbaceis, flore minus exserto, segmentis exterioribus aliter variegatis distincta.

Herba ad 70 cm. alta, rhizomate late repente graciliore spatharum residuis in fibras solutis vestito. *Folia* linearia, acuta, 25–60 cm. longa, 1–1·3 cm. lata, primo erecta, adulta parte superiore demissa, tenuiter prominenter nervosa, uno latere magis minusve glauca. *Scapus* in planta culta ad 70 cm. altus, in spontanea humilior, subteres, solidus, parce ramosus vel saepius simplex. *Spatha* 2-valvis, 2-flora; valvae lanceolatae, acutae vel acute subacuminatae, herbaceae, virides, 7–8 cm. longae. *Pedicellus* sub anthesi 2·5–5 cm., demum ad 7·5 cm. longus. *Perigonium* purpureo-violaceum, variegatum, circiter 7 cm. diametro; tubus vix 1 cm. longus; laciniae exterae ebarbatae, ecristatae, ungue erecto-patente limbo subaequilongo latiusculo, limbo patulo vel subdemisso obovato (explanato obovato-rotundato), basi luteo-suffuso, ad medium albo-variegato, caeterum purpureo-violaceo, 3–3·5 cm. longo; laciniae interiores oblique erectae, oblanceolatae, in unguem gracilem attenuatae, 4–4·5 cm. longae, violaceae. *Antherae* 15 mm. longae. *Styli* rami coerulei, cristis inclusis 4–4·5 cm. longi, crista 1 cm. longa, ad 1·3 cm. lata, lobis sese obtegentibus rotundatis. *Ovarium* 3-gonum. *Capsula* oblonga, 3-gona, 3·5–5 cm. longa, lateribus 1·5–1·7 cm. latis. *Semina* compressa, suborbicularia, 4–4·5 mm. diametro, nigro-fuscescentia, marginibus pallidis.—*I. himalaica*, Dykes in Gard. Chron. 1909, vol. xlv. pp. 3, 36.—O. STAPF.

This handsome Iris was met with for the first time in 1848 by Sir J. D. Hooker, who found it on Tonglo as well as on the Yakla in Sikkim at about 10,000 ft. above sea-level, and made in the field a coloured sketch of the plant which is now in the Kew collection. It was again gathered on Tonglo in 1857 by the late Dr. T. Thomson, in 1868 by the late Dr. T. Anderson, and in 1875 by the late Mr. C. B. Clarke, to whom the species was dedicated by Mr. Baker. It has since been met with in other localities in Sikkim and has been gathered in the Chumbi Valley, further to the east, by the collectors of the late Sir George King, to whom European Iris lovers owe its presence in their collections, where it has found a welcome since 1876. Treated originally, for reasons which have been explained by Mr. Dykes,

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from whose garden at Godalming came the material on which our illustration has been based, as a member of the Pseudevansia group, it now appears that its true position in the genus is near the Western Chinese *I. Delavayi*, Mich., in the Apogon group. Its cultivation offers no especial difficulty and its propagation is easy. Mr. Dykes has called attention to the peculiar liability of this species to considerable variation in the form and coloration of the standards, and to some variation in the foliage. In imported plants he finds that all the leaves have a curiously polished upper surface, whereas in some seedlings there may be found leaves that are distinctly glaucous on both surfaces, while other shoots on the same plants bear leaves which show the characteristic polished upper surface.

DESCRIPTION.—*Herb*; in cultivation sometimes nearly 3 ft. high, in a wild state rarely so tall; rootstock wide-creeping, rather slender, clothed with the fibrous remains of the spathes. *Leaves* linear, acute, 10–24 in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. wide, at first erect, the upper half ultimately drooping, finely but distinctly nerved, more or less glaucous on one side. *Scape* nearly cylindric, solid, sparingly branched or often unbranched. *Spathe* 2-valved and 2-flowered; valves lanceolate, acute or almost acuminate, herbaceous, green, about 3 in. long. *Pedicels* in flower 1–2 in., at length 3 in. long. *Perianth* purple-violet, variegated, nearly 3 in. across; tube about $\frac{1}{3}$ in. long; outer segments unbearded and without crests, the somewhat spreading claw rather broad and about as long as the limb, which is $1\frac{1}{4}$–$1\frac{1}{3}$ in. long, obovate, or when flattened out obovate-rounded, and spreading or slightly drooping, flushed at the base with yellow, splashed with white in the middle and beyond this purple-violet; inner segments obliquely erect, oblanceolate, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, narrowed to a slender claw and of a violet tint. *Anthers* 7 lin. long. *Style-arms* blue, including the crests $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, the lobes rounded, overlapping, the crests 5 lin. long and 6 lin. wide. *Ovary* 3-gonous. *Capsule* oblong, 3-gonous, $1\frac{1}{3}$–2 in. long, the sides 7–9 lin. wide. *Seeds* suborbicular, flattened, 2–$2\frac{1}{4}$ lin. wide, dark brown with pale margins.

Figs. 1 and 2, anthers; 3, stigma; 4, capsule; 5 and 6, seeds:—*all enlarged except 4 and 5, which are of natural size.*

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Tab. 8324.

PHILADELPHUS Delavayi.

Western China.

Saxifragaceae. Tribe Hydrangeae.

Philadelphus, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 642; *Koehne in Regel Gartenflora,* vol. xlv. (1896), p. 450.

Philadelphus Delavayi, *L. Henry in Rev. Hort.* 1903, p. 12, fig. 3; affinis *P. tomentoso,* Wall., sed foliis supra plerumque pilis densioribus et fructibus multo minoribus differt.

Frutex 1–4 m. altus; rami subteretes, cortice deciduo; ramuli steriles parce pilosi, floriferi glabri. *Folia* ovata vel oblongo-lanceolata, apice acute acuminata, basi rotundata vel subcuneata, 2–8 cm. longa, 1–3 cm. lata, tenuiter chartacea, remote denticulata, utrinque, supra tamen parcius, pilosa, nervis lateralibus utrinque 3–4 subtus paulo elevatis; petioli 3–5 mm. longi, parce et longe pilosi. *Ramuli* laterales floriferi 4–5 cm. longi, circiter 5-flori, basin versus foliati; pedicelli 5–7 mm. longi, glabri. *Flores* albi vel extra albo-rosei, 2·5–3 cm. diametro. *Receptaculum* obovoideum, 3 mm. longum, extra glabrum. *Calycis* tubus brevissimus; segmenta 4, ovata, acuminata, 5 mm. longa, 3 mm. lata, extra glabra, intus apicem versus dense villosa. *Petala* elliptica vel obovato-elliptica, apice rotundata, 1–1·3 cm. longa, 0·8–1 cm. lata, utrinque glabra. *Stamina* numerosa, filamentis stylis aequilongis. *Styli* connati, glabri, 4 mm. longi, stigmatibus liberis antheris aequilongis. *Capsula* obovoidea, circiter 6 mm. longa, 5 mm. diametro.—J. Hutchinson.

Few shrubs are more satisfactory in the garden than the members of the genus Philadelphus. They are easily grown and they flower profusely at a time when the great majority of flowering trees and shrubs have gone out of blossom. The one now figured is attractive not only for its abundant clusters of white, well-formed flowers, but for its agreeable fragrance. *P. Delavayi* was first introduced into European gardens by the Abbé Delavay, who sent seeds from Yunnan in 1890. It was again met with in 1904 by Mr. E. H. Wilson, from whose seeds the plant here figured was raised by Messrs. J. Veitch & Sons. Though a distinct and easily recognisable form, it seems somewhat doubtful whether it should be considered specifically separable from the Indian *P. tomentosus,* Wall., for the salient differences are only to be found in the greater degree of tomentum on the upper surface of

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the leaves and the considerably smaller fruit of this, the Chinese representative of Wallich's plant. Like the rest of the genus, *P. Delavayi* thrives in rich moist soil in full sun, and is easily increased by cuttings of soft wood placed in heat. The only pruning necessary is an occasional thinning out of worn out or overcrowding stems; no shortening back can be effected except at the expense of the succeeding crop of blossom.

DESCRIPTION. — *Shrub*; 3–15 ft. high; branches nearly cylindric, bark flaking; sterile twigs sparingly hairy, flowering shoots glabrous. *Leaves* ovate or oblong-lanceolate, sharply acuminate, base rounded or somewhat cuneate, 1¾–3 in. long, ¼–1¼ in. wide, thinly papery, distantly toothed, hairy on both sides, but more sparingly so above, lateral nerves 3–4 on each side slightly raised beneath; petioles 2–3 lin. long, sparingly pubescent with long hairs. *Fertile shoots* lateral, 1¾–2 in. long, about 5-flowered, leafy below; pedicels 3–4 lin. long, glabrous. *Flowers* white, or in bud flushed with rose externally, 1–1¼ in. across. *Receptacle* obovoid, under 2 lin. long, glabrous outside. *Calyx-tube* very short; lobes 4, ovate, acuminate, 2½ lin. long, 1½ lin. wide, outside glabrous, within densely villous towards the tip. *Petals* elliptic or obovate-elliptic, rounded at the tip, 5–7 lin. long, 4–5 lin. wide, glabrous on both sides. *Stamens* many, their filaments as long as the styles. *Styles* connate, glabrous, 2 lin. long, the stigmas free and as long as the anthers. *Capsule* obovoid, about 3 lin. long, 2½ lin. across.

Fig. 1, calyx and pistil; 2 and 3, anthers:—*all enlarged.*

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TAB. 8325.

ARISTOLOCHIA MOUPINENSIS.

Western China.

ARISTOLOCHIACEAE.

ARISTOLOCHIA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 123.

Aristolochia moupinensis, *Franch. in Nouv. Arch. Mus. Par.* 2^{me} sér. vol. x. (1887–8), p. 79; species ex affinitate *A. Kaempferi*, Willd., a qua foliis **haud lobatis pedunculisque bracteatis differt.**

Suffrutex scandens; rami graciles, primum dense sericei, demum puberuli. *Folia* cordata, acuta vel breviter acuminata, 10–12 cm. longa. 6–10 cm. lata, auriculis basalibus rotundatis non vel vix convergentibus, supra impresse punctata et pilis brevibus instructa, subtus cinereo-pubescentes; petiolus 6 cm. longus, hirsutus. *Pedunculi* solitares, axillares, uniflori, 8 cm. longi; bracteae ovatae, 1 cm. longae. *Perianthii* tubus extra dilute viridis, 4 cm. longus, abrupte curvatus, medio inflatus, apice basique attenuatus, extra hirsutus, intus flavus; limbus oblique trilobus, 3 cm. diametro, inter lobos recurvus, intra flavescens rubro-maculatus, marginibus viridibus. *Columna* 4 mm. longa; antherae 6. *Ovarium* 1·5 cm. longum, oblongum; 6-costatum, hirtellum; stigmata 6, brevia, obtusa. *Capsula* 7 cm. longa, 3 cm. diametro, anguste 6-alata.—C. H. WRIGHT.

The Aristolochia here figured was first discovered by Père David in the Moupine region in Western China. Later it was met with at Tsekou in Yunnan by Père Monbeig, and was again collected, at an elevation of 6,500 ft. above sea level in Western China, by Mr. E. H. Wilson on behalf of Messrs. J. Veitch & Sons, in whose nurseries at Coombe Wood it flowered in June 1908 and again in June 1909. *A. moupinensis* is very closely allied to *A. Kaempferi*, Willd., a species figured at t. 49 of Kaempfer's Icones Selectae, edited in 1791 by Sir Joseph Banks, under the name San Kakso. This figure shows the trilobed leaves and the naked peduncle described by Willdenow and evidenced by a Japanese specimen collected by the late Mr. Maximowicz. But another Japanese specimen at Kew collected by Mr. F. V. Dickins and identified by the late Mr. Franchet as *A. Kaempferi*, though it has the naked peduncle of that species, has entire leaves as in *A. moupinensis*, and it may be that eventually the two plants will have to be considered conspecific. The peduncle of *A. moupinensis* is however distinctly longer than that of *A. Kaempferi* and the perianth, although hairy, is less densely so. The material from which our illustration has been prepared was communicated by Messrs. Veitch, who kindly supply the information that the plant has proved quite hardy at Coombe Wood. It flowers there very freely, prefers a rather retentive loamy soil and grows best in a sunny position; no pruning is required beyond the removal of any weak or decayed wood. In its native habitat, according to Père David, it is found growing among shrubs.

DESCRIPTION.—*Undershrub*; scandent with slender branches which at first are densely silky, but when older are merely puberulous. *Leaves* cordate, acute or shortly acuminate, 4–4½ in. long, 2¼–4 in. wide, with rounded but hardly meeting auriculate basal lobes, impressed punctate and beset with short hairs above, greyish pubescent beneath; petiole 2¼ in. long, hirsute. *Peduncles* axillary, solitary, 1-flowered, about 3 in. long; bracts upraised, ovate, 5 lin. long. *Perianth-tube* pale green outside, 1½ in. long, abruptly curved, swollen in the middle, narrowed both to the base and the apex, hirsute without, yellow within; limb obliquely 3-lobed, 1¼ in. across, its margin recurved between the lobes, yellowish with red markings inside, greenish towards the margin. *Column* 2 lin. long; anthers 6. *Ovary* 8 lin. long, oblong, 6-ribbed, somewhat hirsute; stigmas 6, short, obtuse. *Capsule* 2¾ in. long, 1¼ in. across, narrowly 6-winged.

Fig. 1, vertical section of perianth-tube; 2, column:—*both enlarged.*

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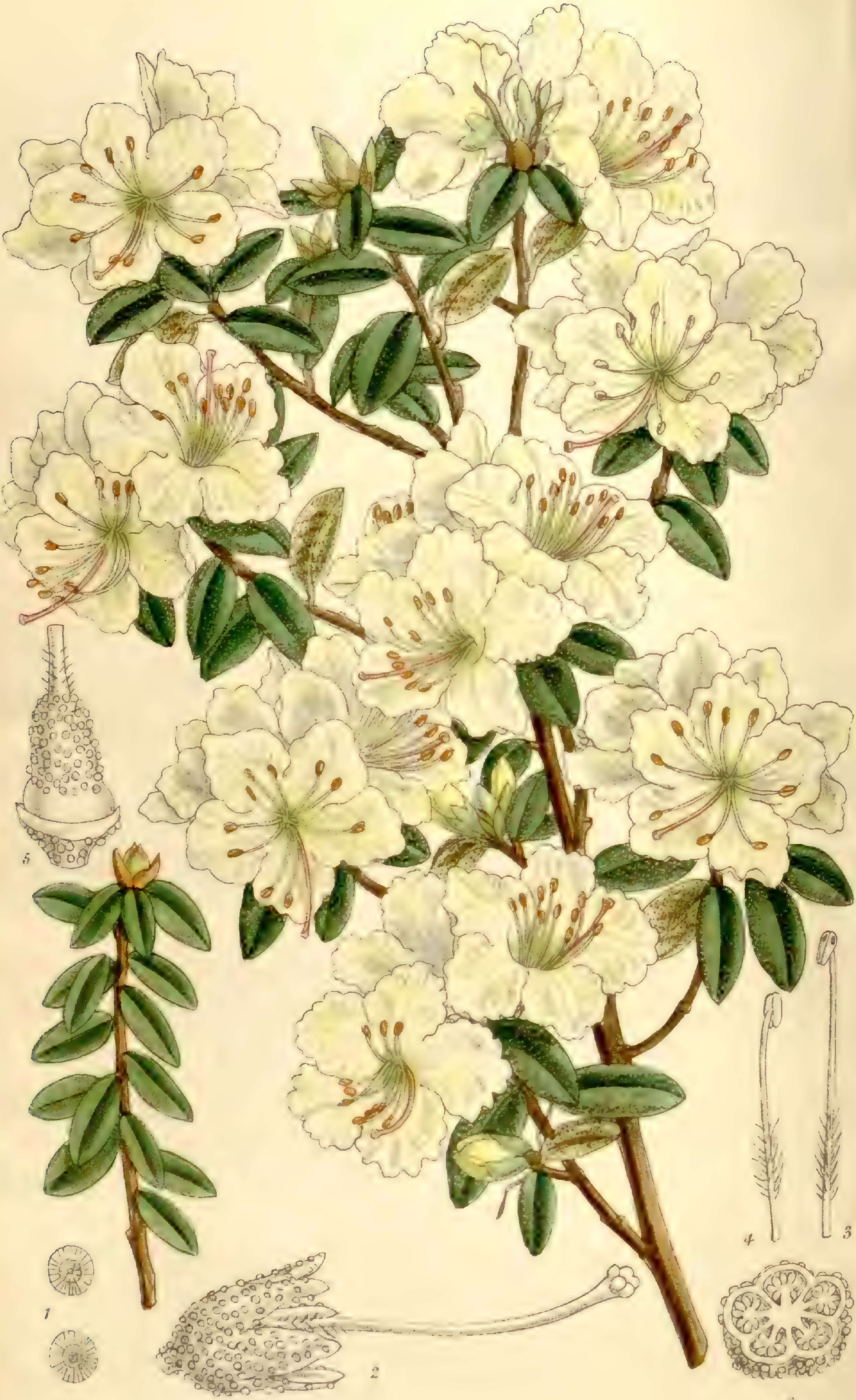

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Tab. 8326.

RHODODENDRON FLAVIDUM.

Western China.

Ericaceae. Tribe Rhodoreae.

Rhododendron, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (Osmothamnus) **flavidum**, *Franch. in Journ. de Bot.* vol. ix. (1895), p. 395; inter species in hortis europaeis cultis *R. lepidoto*, Wall., affinis; ab eo tamen differt imprimis floribus brevissime pedicellatis.

Fruticulus 45-60 cm. altus, praeter corollam fere undique pulchre lepidotus, dense ramosus, ramis tenuibus. *Folia* conferta, imbricata, coriacea, persistentia; lamina ovato-oblonga, 1-2 cm. longa, abrupte apiculata, basi rotundata, concavo-convexa, margine recurva, utrinque creberrime lepidota, supra atroviridis, inter lepides nitida, canaliculata, subtus pallida; petiolus 2-3 mm. longus. *Flores* 3-5, flavi, in ramorum apicibus pedicellati, pedicellis 4-7 mm. longis arcte recurvis. *Calyx* subbilabiatus, herbaceus; lobi leviter inaequales, ovati, 4-6 mm. longi, acute acuminati, demum recurvi. *Corolla* fere regularis, subrotata, circiter 3 cm. diametro, haud lepidota, lobis rotundatis undulatis, fauce villosula. *Stamina* 10, quam corolla breviora, filamentis paulo supra basin et infra medium incrassatis pilosulis. *Ovarium* 5-loculare, densissime lepidotum; stylus cum ovario 16-17 mm. longus, infra medium puberulus. *Capsula* nondum nota.—*R. primulinum*, Hemsl. in Gard. Chron. 1910, vol. xlvii. p. 4.—W. Botting Hemsley.

The pretty little Rhododendron which is here figured is one of the many novelties for the introduction of which horticulture has to thank Messrs. J. Veitch & Sons, who raised plants from seeds secured on their behalf in Western China by Mr. E. H. Wilson. Some of these plants flowered with Messrs. Veitch in their nursery at Coombe Wood in April 1909, when the material from which our illustration has been prepared was communicated. It happens that this is one of the few species obtained by Mr. Wilson, whereof there are no specimens in the herbarium collection at Kew that correspond with the field-number accompanying the seeds, so that nothing is yet known as to the appearance of the fruit. The plants themselves grow well at Coombe Wood in the open ground and without artificial protection, under the conditions suitable to most other species of the genus. When the earliest flowering shoots produced in this country became available they appeared to justify the

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segregation of the plant from *R. flavidum* in consequence of various differences in floral characters. Well developed specimens, subsequently communicated, have, however, satisfied Mr. Hemsley that the characters in question are insufficient, and prove that the form of the calyx-lobes, the length of the corolla-tube and the relative length of the stamens and corolla are by no means constant. *R. flavidum* will be welcomed in gardens as an addition to the scanty group of species with yellow flowers.

DESCRIPTION.—*Shrublet*; 1½–2 ft. high, densely branched, the twigs slender, covered in almost every part save the corolla with fine scales. *Leaves* closely set, overlapping, coriaceous, persistent; blade ovate-oblong, 5–10 lin. long, suddenly apiculate, the base rounded, concavo-convex with recurved margins, closely scaly on both surfaces, dark green above, polished where not covered with scales and channelled along the midrib, beneath paler; petiole 1–1½ lin. long. *Flowers* yellow, 3–5 together at the tips of the twigs, with abruptly recurved pedicels 2–3½ lin. long. *Calyx* almost 2-labiate, herbaceous; lobes somewhat unequal, ovate, 2–3 lin. long, sharply acuminate, at length reflexed. *Corolla* almost regular, nearly rotate, about 1¼ in. wide, without scales, lobes rounded with wavy margins, throat somewhat pubescent. *Stamens* 10, shorter than the corolla, filaments thickened a little above the base and below the middle, somewhat pubescent. *Ovary* 5-celled, very closely scaly; style and ovary together 8–9 lin. long, the style puberulous below the middle. *Capsule* not seen.

Fig. 1, scales from upper side of leaf; 2, calyx and pistil; 3 and 4, stamens; 5, ovary and disk; 6, transverse section of ovary:—*all enlarged.*

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BOTANICAL MAGAZINE.

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Tab. 8322.—BEGONIA MARTIANA, var. GRANDIFLORA. *Mexico.*
„ 8323.—IRIS CLARKEI, *Sikkim.*
„ 8324.—PHILADELPHUS DELAVAYI. *Western China.*
„ 8325.—ARISTOLOCHIA MOUPINENSIS, *Western China.*
„ 8326.—RHODODENDRON FLAVIDUM, *Western China.*

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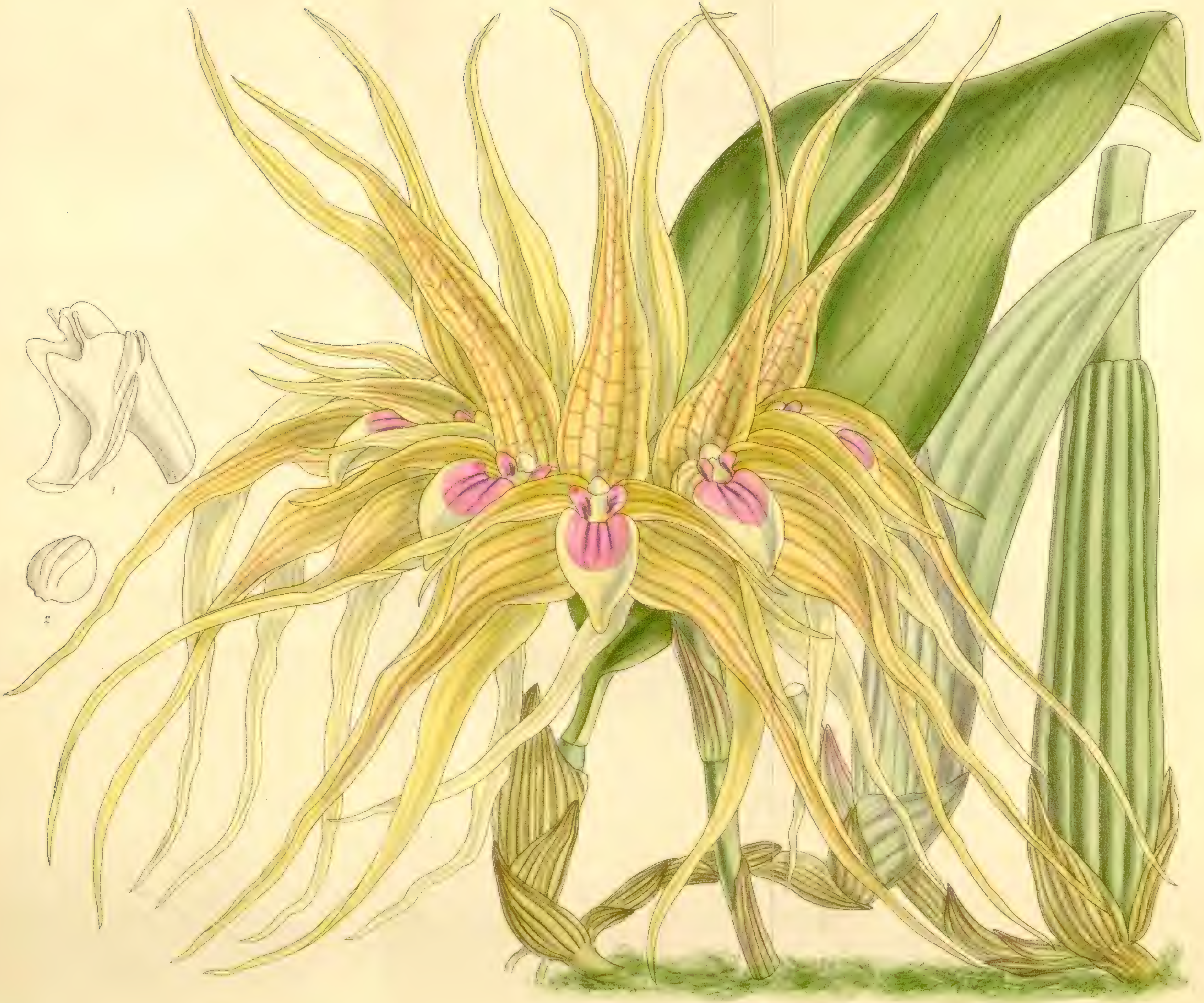

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TAB. 8327.

BULBOPHYLLUM VIRESCENS.

Java.

ORCHIDACEAE. Tribe EPIDENDREAE.

BULBOPHYLLUM, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 501.

Bulbophyllum virescens, *J. J. Sm. in Bull. Inst. Buitenz.* vol. vii. (1900), p. 3; *Ic. Bogor.* vol. ii. p. 99, t. 119, fig. A; *Rolfe in Orch. Rev.* 1904, p. 272; *Gard. Chron.* 1906, vol. xl. p. 261, suppl. tab.; *Orchis*, 1909, p. 123, figs. 16, 17; a *B. Binnendijkii*, Sm., sepalis petalisque viridibus immaculatis differt.

Herba epiphytica *Rhizoma* repens, validum, vaginis striatis imbricatis obtectum. *Pseudobulbi* distantes, lineari-oblongi, striati, 10–13 cm. longi, monophylli, basi vaginis ovatis striatis obtecti. *Folia* petiolata, coriacea, ovato-oblonga, subacuta, 15–20 cm. longa, 7–8 cm. lata; petioli 2–5 cm. longi. *Scapi* suberecti, 16–20 cm. longi, apice decurvi, vaginis spathaceis obtecti. *Bracteae* anguste lanceolatae, acuminatissimae, 2–2·5 cm. longae. *Pedicelli* 2–2·5 cm. longi. *Flores* umbellati, magni, speciosi, 8–10. *Sepala* patentia, ovato-lanceolata, caudato-acuminata, 10–12 cm. longa, pallide viridia, brunneo-venosa et reticulata. *Petala* anguste ovato-lanceolata, caudato-acuminata, 3·5–4 cm. longa, pallide viridia, brunneo-venosa. *Labellum* recurvum, cordato-ovatum, subobtusum, subcarnosum, circiter 2 cm. longum, pallide viride, basi purpureum. *Columna* brevissima, basi in pedem latum producta; dentes oblongi, obtusi.—R. A. ROLFE.

The striking *Bulbophyllum* which forms the subject of our illustration is a member of a very distinct group of Malayan species which includes *B. Pahudii*, Reichb. f., *B. Ericssoni*, Kraenzl., figured at t. 8,088 and *B. Binnendijkii*, J. J. Sm., figured at t. 8,187 of this work. From the last-mentioned species, which is its nearest ally, our plant differs in a few minor structural details and in having flowers without spots. *B. virescens* was first described ten years ago from specimens collected on Mount Tuna in the island of Amboina, at about 2,500 feet above sea level. Shortly thereafter plants which, on flowering, proved to belong to this species were obtained by Messrs. Hugh Low & Co. from an island off the coast of New Guinea. The plant from which our figure has been made was acquired by purchase from Messrs. Low in 1905; it flowered in the tropical Orchid house at Kew in June,

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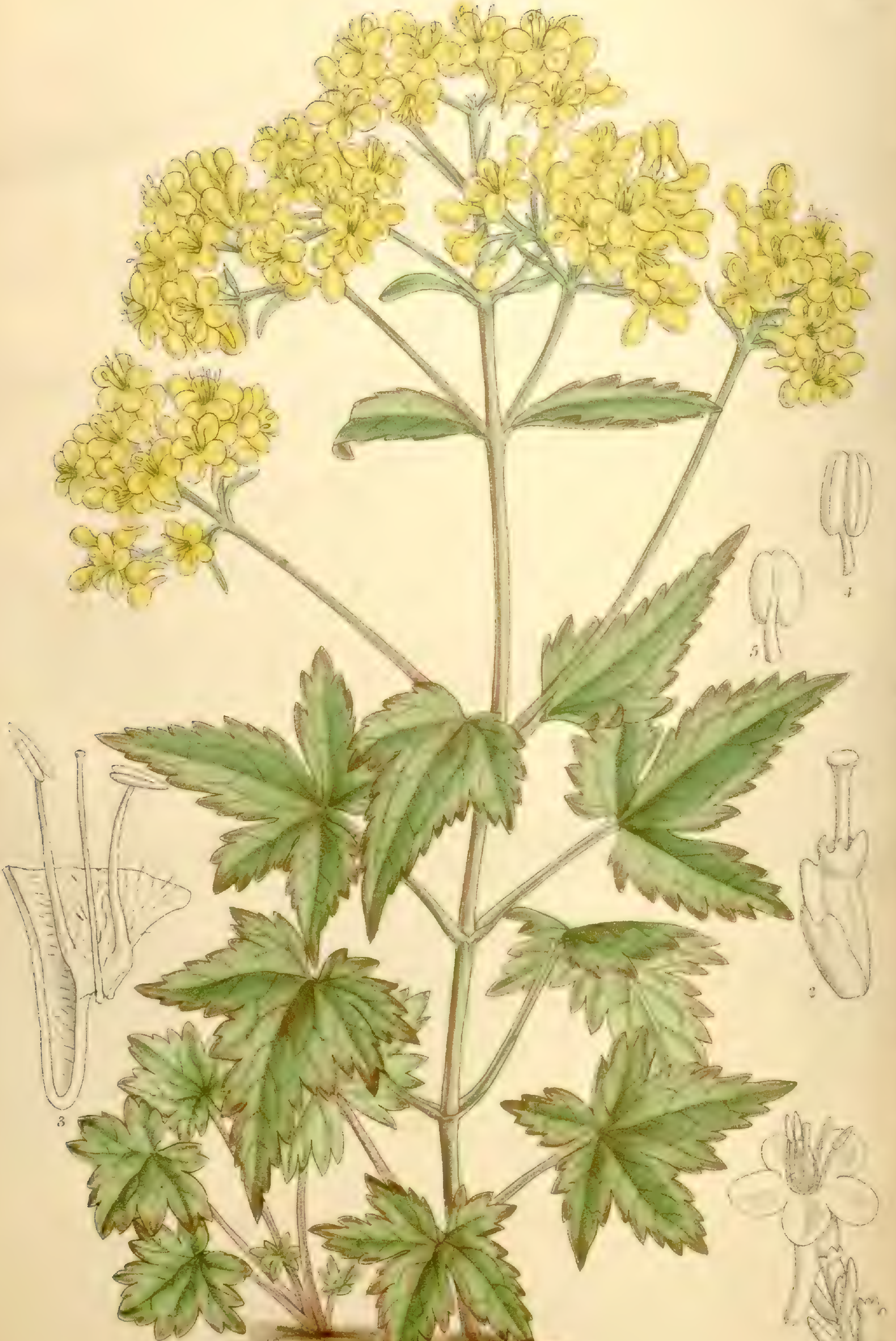
1909, and was as remarkable in appearance as it was disagreeable in odour. It requires the same cultural treatment as its near allies, *B. Ericssoni* and *B. Binnendijkii*; a shallow teak basket, a compost of sphagnum, peat fibre and dead leaves, with a position close to the roof glass in a moist tropical house. When the plant is making new growth plenty of water should be supplied; when growth has finished only enough water should be given to prevent the soil from becoming quite dry.

DESCRIPTION.—*Herb*, epiphytic; rhizome creeping, stout, clothed with striate imbricating sheaths; pseudobulbs remote, linear-oblong, striate, 4–5 in. long, 1-leaved, clothed at the base with ovate striate sheaths. *Leaves* petioled, coriaceous, ovate-oblong, subacute, 6–8 in. long, 2½–3½ in. wide; petioles ¾–2 in. long. *Scapes* suberect, 6–8 in. long, their apices decurved, clothed with spathaceous sheaths; bracts narrow lanceolate, very long acuminate, ¾–1 in. long; pedicels as long as the bracts. *Flowers* large and showy, in 8–10-flowered umbels. *Sepals* spreading, ovate-lanceolate, caudate-acuminate, 4–5 in. long, pale green, with brownish veins and nerves. *Petals* narrowly ovate-lanceolate, caudate-acuminate, 1½–1¾ in. long, pale green with brownish nerves. *Lip* recurved, cordate-ovate, subobtuse, somewhat fleshy, about ¾ in. long, pale green with a purple base. *Column* very short, produced below into a wide foot; teeth oblong, obtuse.

Fig. 1, column and foot; 2, pollinia:—*both enlarged.*



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TAB. 8328.

PATRINIA TRILOBA.

Japan.

VALERIANACEAE.

PATRINIA, *Juss.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 153.

Patrinia (Centrotrinia) **triloba**, *Miq. in Verh. Kon. Akad. Wetensch.* vol. ii. pars iv. p. 22; *Maxim. Mél. Biol.* vol. viii. p. 420; affinis *P. gibbosae*, Maxim., sed corolla paulo majore, caule basi haud nudo, foliis ambitu cordatis vel cordato-ovatis profunde lobatis distincta.

Herba perennis, erecta, inflorescentia excepta simplex 20–40 cm. alta. *Caulis* teres, rubescens, cum pedunculis bifacialiter pubescens, nodis pubescentibus. *Folia* petiolata, petiolis ad 9 cm. longis caulem amplectentibus, radicalia ambitu cordata, superiora cordato-ovata ad 7 cm. longa, 5 cm. lata, profunde palmatim tri- vel quinque-lobata, lobis basalibus minoribus, terminali majore rhombeo plus minusve trilobo, nervis e basi plerumque 5, nervulisque subtus conspicuis, acumine excepto grosse serrata, supra parce subtus in nervis marginibusque puberula. *Cymae* ternae; bracteae infimae foliaceae ambitu ovato-lanceolatae, trilobae, circiter 1·5 cm. longae, 8 mm. latae, grosse serratae, summae lineares, ciliatae, serratae integraeve ad 1 cm. longae, 1 mm. latae. *Calycis* lobi minuti. *Corolla* lutea, tubulosa, 7 mm. longa, calcarata, calcari 2 mm. longo et circiter 1 mm. diametro, tubo calcari aequilongo, extra glabro intus pilis longiusculis obsito. *Stamina* exserta; filamenta fere 5 mm. longa, pilis divergentibus parce instructa. *Ovarium* circiter 2 mm. altum, glabrum; stylus 5 mm. longus, glaber, stigmate capitato. *Fructus* paleae nervosae fere triplo majori adnatus.—*P. palmata*, Maxim. Mél. Biol. vol. vi. p. 267; Bull. Acad. Imp. Petersb. vol. xii. p. 67; Franch. et Savat. Enum. Pl. Jap. vol. i. p. 216. *P. palmatifida*, Maxim. ex Miq. in Verh. Kon. Akad. Wetensch. vol. ii. pars iv. p. 22. *Valeriana triloba*, Miq. in Prol. Fl. Jap. p. 272.—W. G. CRAIB.

The plant here figured, which was raised at Kew from seed received from the Tokyo Botanic Garden, quite merits the encomium "decus generis," bestowed upon it by the late Mr. Maximowicz when he for the first time published it under its proper genus. Its nearest ally is *Patrinia gibbosa*, Maxim., like the subject of our illustration a native of Japan; both are members of the section *Centrotrinia*, founded by Maximowicz to include those species in which the corolla is gibbous or spurred and the fruit is adnate to an accrescent bract. *P. triloba* is, however, readily distinguished from *P. gibbosa* by its larger flowers, its rather smaller, sharply lobed and cordate leaves and its leafy stem. Siebold was the first European botanist to meet with *P. triloba*, which is

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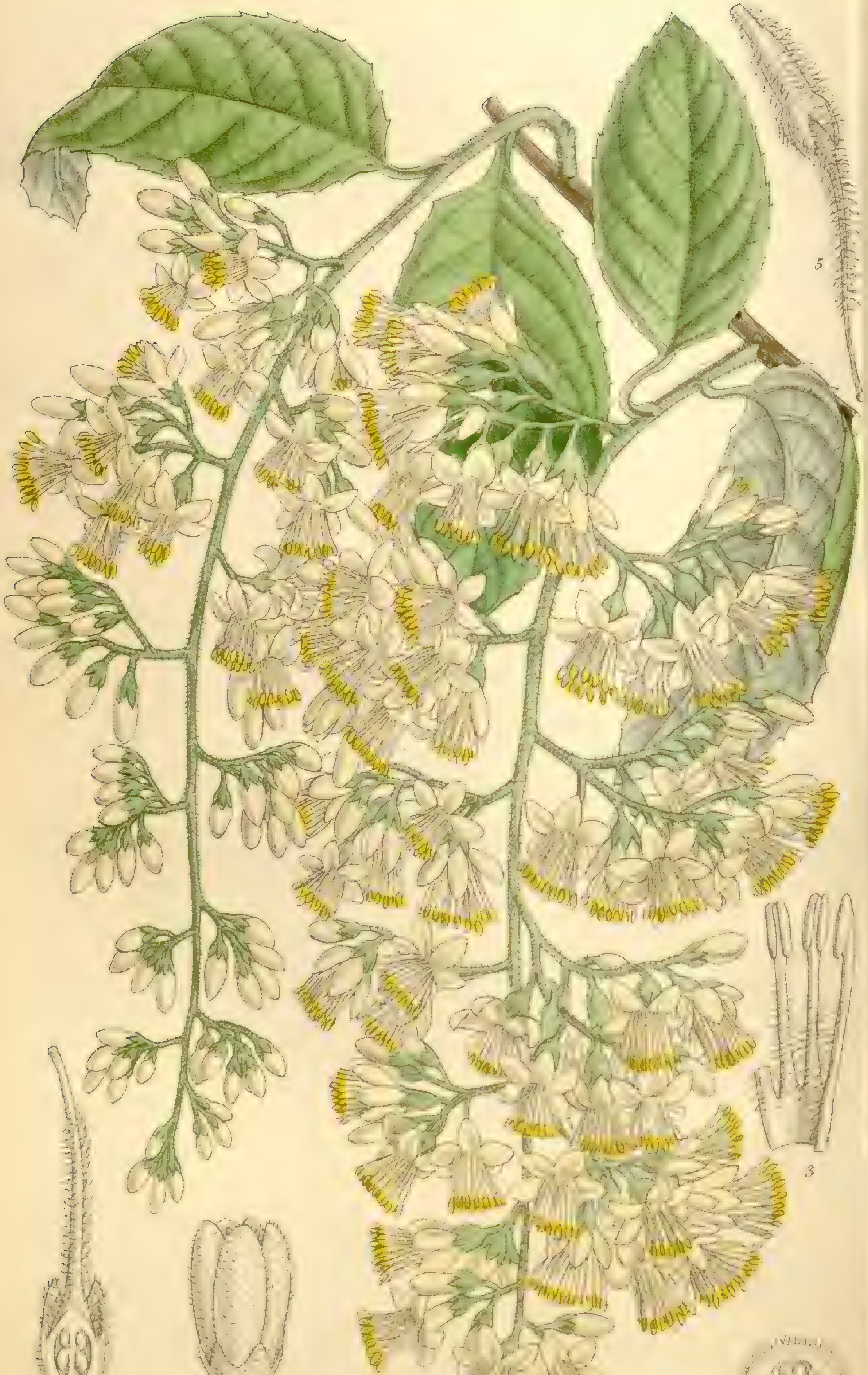
confined to the woodland tracts of Central and Northern Japan; his specimens formed the basis of *Valeriana triloba*, Miq. It was again met with by Maximowicz, whose specimens were distributed as *Patrinia palmatifida*, a name modified in 1867, when the species was formally published, to *P. palmata*. The study of the specimens issued by Maximowicz had meantime satisfied Miquel that the plants collected by Siebold and by Maximowicz are conspecific and that the generic position accorded to the species by Maximowicz is correct. The adjustment of name thereby rendered necessary was made by Miquel in 1870 and endorsed by Maximowicz a year later. *P. triloba* is a hardy herbaceous perennial, easily cultivated under the conditions suitable for most of the species of *Patrinia* and *Valeriana*. It thrives well in the Rock Garden at Kew, where it is in flower in July and August, the months during which it also flowers in a wild state.

DESCRIPTION.—*Herb*, perennial; stems erect, terete, reddish, 8–16 in. high, unbranched below the inflorescence, with lines of pubescence on the peduncles and with pubescent nodes. *Leaves* petioled, the radical cordate, those of the stem ovate-cordate, deeply palmately 3- or 5-lobed, and usually 5-nerved from the base, the largest 3 in. long, 2 in. wide; basal lobes rather smaller than the rhomboid more or less 3-lobed central; main and secondary nerves beneath rather prominent; margin rather coarsely toothed except towards the tips of the lobes; sparingly hairy above, more markedly pubescent on the margins and along the nerves beneath; petioles slender 3½ in. long, stem-clasping at the base. *Cymes* 3-nate; lower bracts leafy, ovate-lanceolate, 3-lobed, coarsely toothed, about 8 lin. long, 4 lin. wide, upper linear, ciliate, toothed or entire, 5 lin. long. *Calyx-teeth* minute. *Corolla* yellow, tubular, 3½ lin. long, with a spur about 1 lin. long; tube as long as the spur, glabrous without, hirsute with rather long hairs within. *Stamens* exserted; filaments nearly 2½ lin. long, sparingly hirsute with spreading hairs. *Ovary* glabrous, about 1 lin. long; style glabrous, 2½ lin. long; stigma capitate. *Fruit* adnate to a large, veined pale.

Fig. 1, flower; 2, calyx and pistil; 3, section of corolla-tube; 4 and 5, anthers: —*all enlarged.*

8325



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TAB. 8329.

PTEROSTYRAX HISPIDUM.

Japan.

STYRACEAE.

PTEROSTYRAX, *Sieb. et Zucc. Fl. Jap.* vol. i. p. 94.

Pterostyrax hispidum, *Sieb. et Zucc. in Abh. Akad. Muench.* vol. iv. pars iii. p. 132; *Carrière in Rev. Hort.* 1875, p. 307, fig. 50, et 1876, p. 394, fig. 83, 84; *Franch. et Savat. Enum. Pl. Jap.* vol. i. p. 310; *Peters in Engler, Pflanzenr.—Styracaceae,* p. 103 (hispidus); affinis *P. corymboso,* Sieb. et Zucc., sed floribus in paniculo angusto elongato dispositis et fructu distinguenda.

Arbor ramis glabris et cortice cinereo-brunneo. *Folia* alterna, exstipulata, petiolis 1–2·5 cm. longis, laminis 6–21 cm. longis, 3–10 cm. latis ellipticis acutis vel breviter acuminatis basi acutis denticulatis supra viridibus subtus pallidioribus et glabris vel minutissime albido-tomentosis secus venis pubescentibus. *Paniculi* axillares, 10–16 cm. longi, 4–5 cm. lati, adscendentes vel penduli, basi 2–3-foliati, superne ebracteati, pilis patulis pubescentes, ramis patentibus 1·5–2 cm. longis bifurcatis secundifloris, floribus subconfertis. *Pedicelli* 1–2 mm. longi. *Calyx* obconicus, pluricostatus, 5-dentatus, minute albo-tomentosus, dentibus 1–1·3 mm. longis deltoideo-ovatis acutis. *Corolla* fere ad basin 5-partita, utrinque minute subtomentosa, alba, lobis 8 mm. longis 3–3·5 mm. latis patentibus vel recurvis elliptico-oblongis obtusissimis. *Stamina* 10, 1–1·1 cm. longa, filamentis pubescentibus basi in tubo connatis; antherae lineari-oblongae, dorsifixae. *Ovarium* inferum, 3-loculare, loculis 4-ovulatis; stylus staminibus longior, basi conico-incrassatus, pubescens. *Ovula* medio axi affixa, 2 superioribus erectis 2 inferioribus pendulis. *Fructus* 1 cm. longus, 2·5 mm. crassus, subclavato-fusiformis, pluri-costatus, haud alatus, dense hispidus, stylo terminatus.—*Halesia hispida,* Mast. in Gard. Chron. 1884, vol. xxii. p. 176, fig. 34, et 1909, vol. xlvi. p. 89; Shirasawa, Ic. Jap. vol. ii. t. 65, fig. 1–3.—N. E. BROWN.

The genus *Pterostyrax*, to which the subject of our plate belongs, is so nearly allied to *Halesia*, Linn., and so similar to that genus in floral characters, that in the Genera Plantarum the two were united by Bentham and Hooker. But the position of the inflorescence, the absence of broad wings on the fruit, the shape of the corolla and the difference in number of corolla lobes so markedly distinguish *Pterostyrax* and *Halesia* that the two are now, by almost universal consent, kept apart. The two groups inhabit different areas, for while *Halesia* is an American genus, *Pterostyrax* is

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confined to the old world, being represented by three species in Japan and by two in China. Specimens of one of the Chinese species have indeed at times been referred to the species here depicted; this identification, it is now found, cannot be sustained. One of the most distinct and beautiful of hardy trees, *P. hispidum* grows well at Kew, and flowers freely almost every year. When its branches are furnished with their long pendent panicles, an example of *P. hispidum* is one of the most effective ornaments of the garden, the more so because, flowering as it does in late June, it escapes comparison with other trees, equally striking, which by then are out of flower. It thrives in a good loamy soil and in a sunny situation and, like most trees of its class, flowers most abundantly after a hot autumn. It has never suffered in the least from frost at Kew, but it grows to a larger size and more quickly in the warmer counties, and the material from which our plate has been prepared was derived from a particularly handsome specimen in the garden of Canon Ellacombe at Bitton, near Bristol. In the south-west of Ireland there are some splendid examples approaching 40 feet in height and more in diameter of crown. The species should be raised from seed which occasionally ripens in this country and has been offered several times in recent years for exchange in the Kew seed-list. Japanese nurserymen also offer it at moderate rates, but usually under the name of its nearest ally, *P. corymbosum*. The variable character of the underside of the leaves is not due to age, for leaves that are finely white tomentose and leaves that are glabrous beneath may be found on the same branch.

Description.—*Tree*, with glabrous branches and ashy-brown bark. *Leaves* alternate, denticulate $2\frac{1}{2}$–8 in. long, $1\frac{1}{4}$–4 in. wide, elliptic, acute or shortly acuminate, base cuneate, green above, paler and smooth or in leaves of the same age finely white tomentose beneath, the veins pubescent; petiole $\frac{1}{2}$–1 in. long; stipules 0. *Panicles* axillary, 4–6 in. long, $1\frac{3}{4}$–2 in. wide, ascending or pendent, 2–3-leaved at the base, bractless above, pubescent with spreading hairs, their branches spreading, $\frac{3}{4}$–1 in. long, 2-furcate; flowers somewhat clustered and secund, their pedicels 1 lin. long or less. *Calyx* obconic, many-nerved, 5-toothed, finely white pubescent; teeth about ½ lin. long deltoid-ovate, acute. *Corolla* 5-partite almost to the base, white, finely pubescent on both sides; lobes 4 lin. long, 1½–2 lin. wide, elliptic-oblong, quite obtuse, spreading or recurved. *Stamens* 10, 5–6 lin. long; filaments pubescent and connate below; anthers linear-oblong, dorsifixed. *Ovary* inferior, 3-celled, the cells 4-ovuled; style longer than the stamens, pubescent, thickened downwards; ovules attached near the centre of the axis, the upper pair erect, the lower pair pendulous. *Fruit* 5 lin. long, 1 lin. wide, subclavately fusiform, many-ribbed, wingless, densely hispid, tipped by the style.

Fig. 1, flower, partly open; 2, calyx and pistil in longitudinal section; 3, part of the staminal tube and stamens; 4, ovary in transverse section; 5, young fruit:—*all enlarged.*

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TAB. 8330.

GAMOGYNE PULCHRA.

Malaya.

AROIDEAE. Tribe PHILODENDREAE.

GAMOGYNE, *N. E. Br.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 985.

Gamogyne pulchra, *N. E. Br. in Kew Bull.* 1910, p. 197; affinis *G. Burbidgei*, N. E. Br., sed pistillodiis basalibus, staminodiis deficientibus, stigmatibus rubris spathaque kermesina differt.

Herba perennis, acaulis, omnino glabra. *Folia* suberecta, petiolata; lamina 3–17 cm. longa, 2–3·7 cm. lata, lanceolata, acuta, basi cuneato-acuta, supra viridis subtus pallidior; petiolus 5–9 cm. longus, teres, canaliculatis, basi breviter sed late vaginans. *Pedunculi* erecti circiter 14 cm. longi, teretes, rufo-brunnei. *Spatha* subnutans, ellipsoidea, acuta, convoluta, apice tantum aperta, 4–4·5 cm. longa, 2 cm. diametro, laete kermesina. *Spadix* quam spatha fere duplo brevior, inclusus, cylindraceus, obtusus, parte feminea quam pars mascula subduplo breviore basi organis neutris (ovariis abortis) truncatis flavo-virentibus instructa, parte mascula parti femineae contigua staminodiis deficientibus. *Antherae* oblongae, compressae, truncatae, apice biporosae, flavescentes. *Ovaria* oblonga, truncata, connata stigmatibus puniceis sessilibus, 1-locularia placentis duabus parietalibus et basalibus brevibus. *Ovula* plurima, erecta, suborthotropa, funiculis elongatis.—N. E. BROWN.

The plant now figured was received at Kew from the Singapore Botanic Gardens in 1905 with the suggestion that it might be a form of *Piptospatha Ridleyi*, N. E. Br., figured at t. 7410 of this work; another species of the same genus, *P. insignis*, N. E. Br., is given at t. 6598. The two genera are indeed so closely allied as to be indistinguishable so far as any vegetative character is concerned. They are, however, readily discriminated when in flower because in *Piptospatha* the connective is produced and the ovaries are distinct, whereas in *Gamogyne*, the genus to which our plant belongs, the anthers are truncate and the ovaries are united. The plant figured has been grown on a small rockery in the Nepenthes house, where it has thriven well and has formed a sturdy tuft of leaves; it flowered for the first time in March, 1909, and thus enabled its generic position to be ascertained. As a garden plant *Gamogyne pulchra* is superior to either of the species of *Piptospatha* mentioned above, and in this respect is even preferable to its nearest ally, *Gamogyne Burbidgei*, N. E. Br., a Bornean plant which is well known in tropical collections. The botanical characters that distinguish *G. pulchra* from *G. Burbidgei*, it will be observed, are not very striking; the species now figured is provided with neuter organs at the base of the spadix where in *G. Burbidgei* there are none; on the other hand, *G. Burbidgei* has neuter organs situated between the male and female portions of the spadix, a situation in which there are no neuter organs in *G. pulchra*. The stigmas of *G. pulchra* are red, whereas in *G. Burbidgei* they are greenish yellow, but the most marked distinction between the two plants, from the cultural standpoint, lies in the colour of the spathe which in *G. pulchra* is much deeper and brighter red than in *G. Burbidgei*. The localities from which the two species have been reported are somewhat remote; *G. pulchra* comes from the Malayan Peninsula, and has not, so far, been met with in Borneo. Mr. H. N. Ridley has kindly informed us that *G. pulchra* comes from the rocky stream on Gunong Pulai in Johor. Gunong Pulai is the most eastern peak in the range of which Gunong Panti, the original habitat of *Piptospatha Ridleyi*, is the most western hill.

DESCRIPTION.—*Herb*, perennial, everywhere glabrous. *Leaves* suberect, petioled; blade 1¼–1½ in. long, ¾–1½ in. wide, lanceolate, acute, base cuneate, green above, paler beneath; petiole 2–3½ in. long, terete, channelled, base shortly but broadly sheathing. *Peduncles* erect, about 5½ in. long, terete, reddish brown. *Spathe* almost nodding, ellipsoid, acute, convolute, opening only at the top, 1½–1¾ in. long, ¾ in. wide, bright crimson. *Spadix* hardly more than half as long as the spathe, included, cylindric, obtuse, the female portion hardly more than half as long as the male, beset at the base with yellowish green pistillodes, passing abruptly to the male portion without intervening staminodes. *Anthers* oblong, compressed, truncate, with 2 apical pores, yellowish. *Ovaries* oblong, 1-celled, truncate, united; the stigmas sessile, pink; ovules numerous, erect, almost orthotropous, attached to 2 short basal and partly parietal placentas.

Fig. 1, spadix with the spathe removed; 2, stamen; 3, ovaries; 4, an ovary in longitudinal section; 5, ovule; 6, sketch of an entire plant:—1–5 *enlarged*, 6 *much reduced*.

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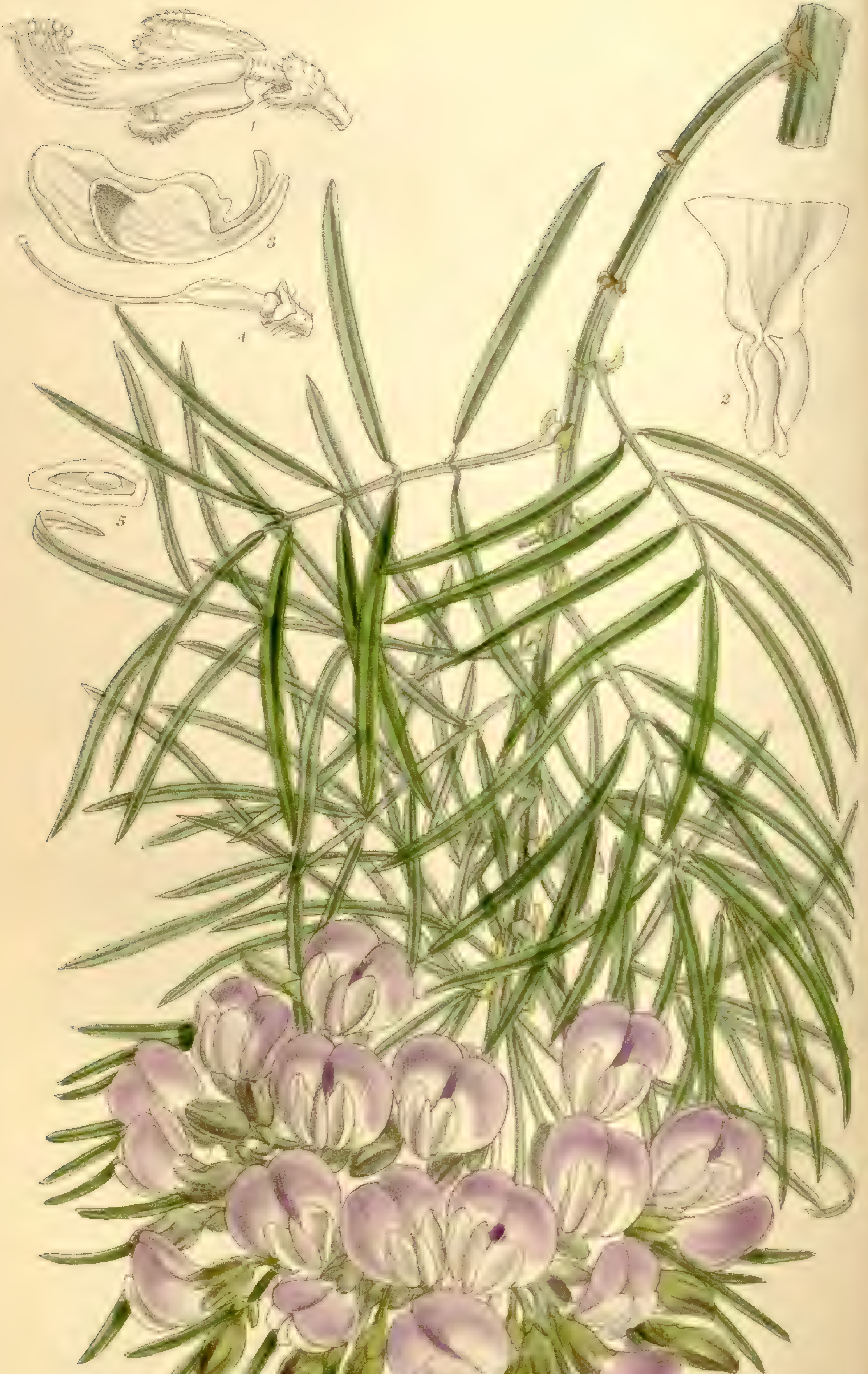

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TAB. 8331.

PSORALEA AFFINIS.

South Africa.

LEGUMINOSAE. Tribe GALEGEAE.

PSORALEA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 491.

Psoralea affinis, *Eckl. et Zeyh. Enum.* p. 224; affinis *P. pinnatae*, Linn., sed pedunculis elongatis foliis aequilongis et calycis lobis obtusissimis utrinque dense nigro-hirsutis differt.

Frutex; rami quadrangulares, glabri vel parcissime pilosi, conspicue resinoso-punctati; ramuli floriferi procumbentes, usque ad 25 cm. longi, plus minusve angulares, circiter 3 mm. diametro, glabri vel novelli parce nigro-pilosi. *Folia* imparipinnata, 3–4-juga, petiolo communi 3–4 cm. longo supra anguste canaliculato parce piloso; foliola opposita, breviter petiolulata, linearia, acuta, 4–5 cm. longa, 2–3 mm. lata, 1-nervia, coriacea, glabrescentia, nigro-punctata; petioluli carnosi, pubescentes, 1 mm. longi; stipulae carnosae vel coriaceae, ovato-lanceolatae, acutae, majores 4 mm. longae. *Pedunculi* axillares, 1-flori, apices ramulorum versus conferti, foliis aequilongi, pubescentes, bracteis bilabiatis calycinis apicalibus instructi. *Calycis* tubus subcampanulatus, 6 mm. longus, 5 mm. diametro, conspicue resinoso-glandulosus, extra 10-costatus, costis dense nigro-pilosis; calycis lobi oblongo-ovati, apice rotundati, 4 mm. longi, 3 mm. lati, utrinque dense nigro-hirsuti. *Corolla* coerulea nisi carina apicem versus atro-purpurea; vexilli limbus latissime obovatus, apice truncatus, emarginatus, 1·5 cm. latus, multistriatus, utrinque glaber, ungue 4 mm. longo: alae oblongo-ellipticae, apice rotundatae, 1–3 cm. longae, 6 mm. latae, unguibus 7 mm. longis; carina obtusa, alis fere aequilongi. *Tubus staminalis* 1·2 cm. longus. *Ovarium* 3 mm. longum, glabrum; stylus gracilis, 1 cm. longus, glaber, stigmate parvo globoso.—*P. pinnata*, var. *subglabra*, Harv. in Harv. & Sond. Fl. Cap. vol. ii. p. 145.—J. HUTCHINSON.

The plant here figured has long been grown in gardens under the name of *Psoralea pinnata*, itself an old garden plant which is stated in the Hortus Kewensis to have been in cultivation at Hampton Court so long ago as 1690. When Ericas and other South African shrubs were more in favour than they are at present, *P. pinnata* was a favourite greenhouse plant, and it is by no means improbable that then, as now, the two forms were in cultivation without being distinguished from each other. The right of the form here figured to separate recognition was pointed out by Ecklon and Zeyher more than seventy years ago, and although the late Dr. Harvey was led to treat *P. pinnata*, somewhat comprehensively, as a species with four distinct varieties of which our plant is one, Mr. Hutchinson points out that the characters which distinguish the two are such as to justify their segregation, not merely from the standpoint of the cultivator, but from that of the taxonomist. The peduncles of *P. pinnata* are exceedingly short, its calyx-lobes are ovate-lanceolate, acute and subglabrous, while the indumentum is much less dense than in *P. affinis*, which has peduncles as long as the leaves, a strongly 10-ribbed calyx tube, and short, rounded, very densely hirsute calyx lobes. The true *P. pinnata* is widely spread in South Africa from the Cape Peninsula to Algoa Bay. The plant here figured has a more restricted range and has been met with only in the divisions of George, Knysna, Uniondale and Uitenhage. In most parts of England *P. affinis* can only be grown as a pot plant, when it may be made to form bushes 3 feet or so in height, or planted in the border of a sunny greenhouse, when it soon becomes a large Cassia-like shrub reaching 10 feet high; at Kew it flowers in early spring and forms a very attractive object in the Conservatory and the Temperate House. The specimen from which our plate has been prepared came, however, from the garden of Mr. T. A. Dorrien Smith, Tresco Abbey, Isles of Scilly, where the plant is quite hardy in the open and flowers in April.

DESCRIPTION.—*Shrub*; branches 4-angled, glabrous or sparingly hairy, with resinous glands; flowering twigs procumbent, up to 10 in. in length, more or less angled, about 1½ lin. thick, glabrous or at first sparingly pilose with black hairs. *Leaves* odd-pinnate; leaflets opposite, 3–4-paired, shortly stalked, linear, acute, 1¾–2 in. long, 1–1½ lin. wide, 1-nerved, coriaceous, soon becoming glabrous, dotted with black glands; leaf-rachis 1¼–1½ in. long, narrowly channelled above, sparingly hairy; petiolules fleshy, pubescent, ½ lin. long; stipules fleshy or coriaceous, ovate-lanceolate, acute, the largest 2 lin. long. *Peduncles* axillary, 1-flowered, clustered at the ends of the branches, as long as the leaves, pubescent, with two terminal bilabiate calycine bracts. *Calyx* with a subcampanulate tube 3 lin. long, 2½ lin. wide, with conspicuous resinous glands, 10-ribbed externally, the ribs densely hirsute with black hairs; lobes oblong-ovate with rounded tips, 2 lin. long, 1½ lin. wide, densely hirsute on both sides with black hairs. *Corolla* blue, with a dark purple keel-tip; standard-limb wide obovate, tip truncate emarginate, 8 lin. wide, glabrous, claw 2 lin. long; wings oblong-elliptic, rounded, 6 lin. long, 3 lin. wide; keel obtuse almost as long as the wings. *Staminal* tube 6 lin. long. *Ovary* 1½ lin. long, glabrous; style slender, 5 lin. long, glabrous; stigma small, globose.

Fig. 1, calyx laid open, with pistil; 2, base of vexillum; 3, wing and keel petals; 4, pistil; 5, section of ovary:—*all enlarged.*

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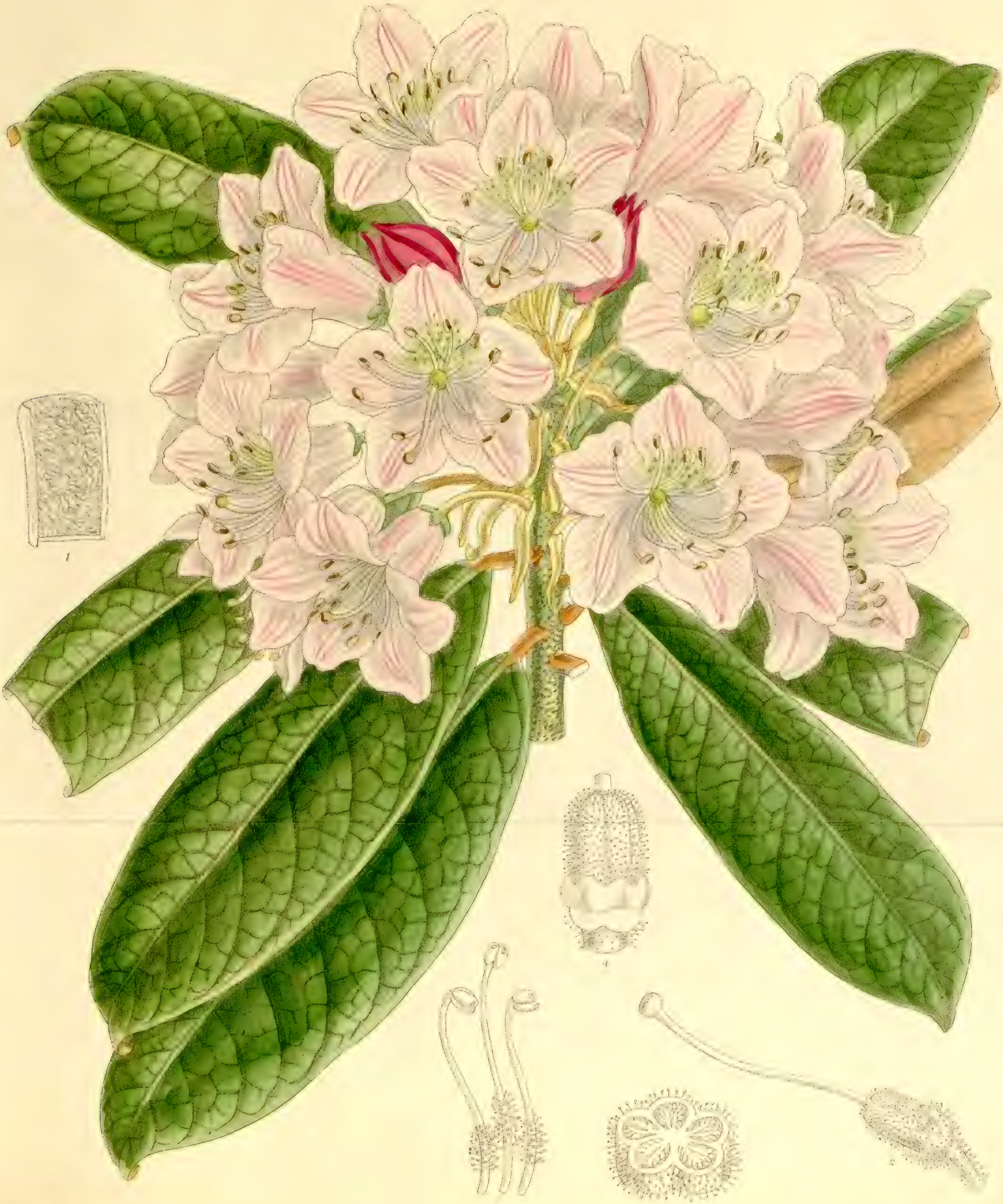

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TAB. 8332.

RHODODENDRON UNGERNII.

Caucasus.

ERICACEAE. Tribe RHODOREAE.

RHODODENDRON, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 599.

Rhododendron (Eurhododendron) Ungernii, *Trautv. in Acta Hort. Petrop.* vol. ix. (1884), p. 514; *Regel, Gartenflora*, vol. xxxiv. (1885), p. 335 *et* vol. xxxv. (1886), pp. 378, 1226; *Lipsky, Consp. Fl. Cauc. in Acta Hort. Tiflis*, vol. iv. p. 382; inter species caucasicas foliis oblongo-oblanceolatis rigide apiculatis subtus densissime fulvo-tomentosis et floribus dilute roseis distinctum.

Frutex vel *arbor* parva, 4–6 m. alta, ramis floriferis crassis rigidis rectis primum pubescentibus. *Folia* valide petiolata, sparsa, biennia vel triennia; lamina crasse coriacea, rigida, oblongo-oblanceolata, 10–15 cm. longa, maxima supra medium 5 cm. lata, apice rotundata simul apiculata, basi cuneata, supra glabra, saturate viridia, subtus densissime firmiterque fulvo-tomentosa; costa supra impressa, subtus crassa, elevata, venis utrinque inconspicuis; petiolus crassus circiter 2 cm. longus, primum pubescens, leviter canaliculatus. *Flores* albo-rosei, circiter 5 cm. diametro, racemoso-corymbosi, corymbis 20–30-floris et 15–20 cm. diametro; pedicelli graciliusculi, 3–4 cm. longi, pilis albis crispulis parce vestiti; bracteae angustae, acutae, quam pedicelli breviores, fulvae, albo-pilosulae, cito deciduae. *Calycis* lobi inaequales, 3–6 mm. longi, lanceolati, obtusi, glanduloso-ciliati. *Corolla* late campanulata, extra glabra, intus infra medium puberula, usque ad medium 5-lobata; lobi fere aequales, lati, rotundati, obscure emarginati, recurvi, posterior major intus obscure punctatus, omnes longitudinaliter venoso-striati. *Stamina* 10, quam corolla triente breviora, inter se alterna paullo breviora; antherae breves; filamenta filiformia, infra medium et paullo supra basin zona glandularum stipitatarum ornata. *Ovarium* 5-loculare, pilis crassis crispulis dense vestitum; stylus glaber, stamina paullo excedens. *Capsula* subcylindrica, circiter 1·5 cm. longa, glabrescens. *Semina* circiter 1·5 mm. longa, utrinque cristata.—W. B. HEMSLEY.

The species here figured is a native of the district of Batoum to the south of the Caucasus, where the familiar *Rhododendron ponticum*, Linn., figured at t. 650 of this work, is also wild. It was discovered some twenty-five years ago, by Baron Ungern-Sternberg, growing under *Picea orientalis* at elevations of from 4000 to 6000 feet above sea-level, where it occupies a zone between that of *R. ponticum*, at lower levels, and that of *R. caucasicum*, Pall., figured at t. 1145 of this work, higher up. The subject of our illustration was raised from seed received from the Imperial Botanic Garden, St. Petersburg, in 1866; at Kew it has been grown in a pot under the conditions most

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suitable for Himalayan species and is now a bush about 6 feet high, with leathery dark green leaves, smooth above but densely woolly below. It has very rarely flowered; the flowers now figured were produced in July, 1909. Although it has hitherto been afforded protection during winter there is reason to think, when its native habitat and the behaviour of other species from the same region are taken into account, that it may prove hardy in this country.

DESCRIPTION.—*Shrub,* or small tree, 12–20 feet high; flowering twigs straight and stout, at first pubescent. *Leaves* distinctly petioled, alternate, persisting for 2–3 seasons, thickly coriaceous, firm, oblong-oblanceolate, 4–6 in. long, the largest 2 in. wide above the middle, tip rounded and apiculate, base cuneate, glabrous and dark green above, beneath closely and firmly tawny-tomentose, midrib impressed above, strong and raised beneath, lateral nerves inconspicuous on either surface; petiole stout, about ¾ in. long, pubescent at first, slightly channelled. *Flowers* pale-rose, about 2 in. across, corymbose, corymbs 20–30-flowered, 6–8 in. through; pedicels somewhat slender, 1¼–1¾ in. long, sparingly clothed with crisp white hairs; bracts narrow, acute, shorter than the pedicels, tawny, with a white pubescence which soon disappears. *Calyx-lobes* unequal, 1½–3 lin. long, lanceolate, obtuse, glandular-ciliate. *Corolla* widely campanulate, glabrous outside, within puberulous below the middle, 5-lobed halfway down, the lobes almost uniform, broad, rounded, faintly emarginate, recurved, the uppermost, which is slightly larger than the others, faintly dotted, all distinctly longitudinally veined. *Stamens* 10, one-third shorter than the corolla, alternately shorter and longer; anthers short; filaments filiform, with a band of glandular stipitate hairs below the middle and a little above the base. *Ovary* 5-celled, densely clad with stout crisp hairs; style glabrous, somewhat longer than the stamens. *Capsule* subcylindric, about ⅔ in. long, almost glabrous. *Seeds* under 1 lin. long, crested at both ends.

Fig. 1, part of a leaf showing undersurface; 2, calyx and pistil; 3, stamens; 4, ovary; 5, section of ovary:—*all, except* 1, *enlarged.*

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TAB. 8333.

CHIRITA RUPESTRIS.

Malay Peninsula.

GESNERACEAE. Tribe CYRTANDREAE.

CHIRITA, *Ham.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1022; *Clarke in DC. Monogr. Phan.* vol. v. pars 1, p. 109.

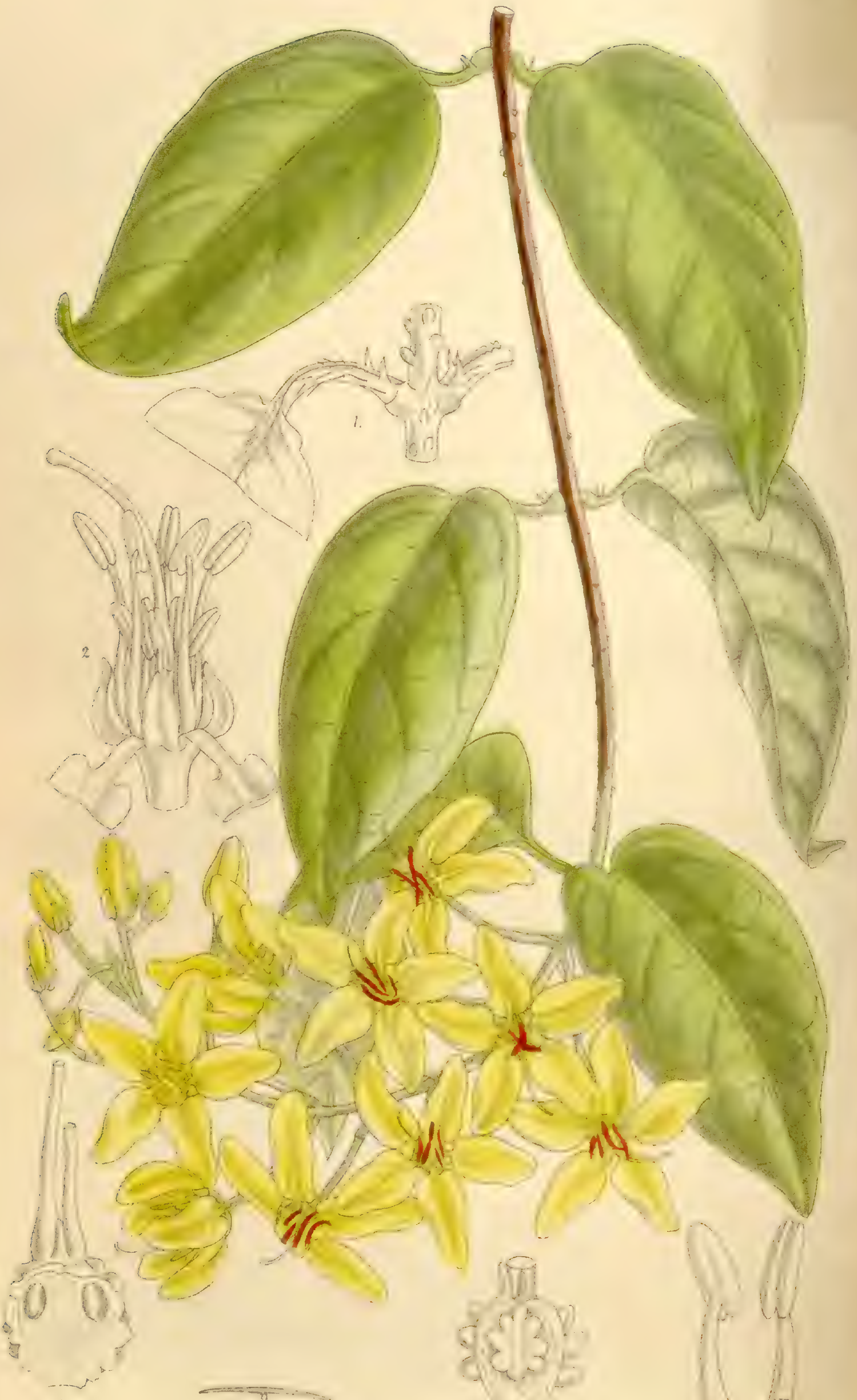
Chirita rupestris, *Ridl. in Journ. Str. Br. Roy. As. Soc.* n. 43 (1905), p. 59 *et in King & Gamble, Mat. Fl. Mal. Pen.* iv. 976 (*Journ. As. Soc. Beng.* vol. lxxiv. pars 2, p. 766); inter species in peninsula malayana adhuc obvias *C. Glasgovii*, Ridl., maxime affinis, corolla dimidio breviore facillime tamen distinguenda.

Herba erecta, simplex vel e basi ramosa, 30-60 cm. alta, caule glabrescente. *Folia* opposita, ovata, apice subacuta, basi inaequalia, truncata rotundata vel subcuneata, 5-8 cm. longa, 2·5-6 cm. lata, margine serrata, membranacea, subtus parce farinosa, utrinque pilosa, pilis supra longiusculis multicellularibus subtus brevioribus, nervis lateralibus utrinque circiter 10 subtus prominulis; petioli ad 7 cm. usque longi, pilosi, supra canaliculati. *Pedunculi* axillares, solitarii vel bini, 4-8-flori, 1-3·5 cm. longi; bracteae connatae cupulam pilosam margine crenato-serratam formantes. *Pedicelli* glabri, fere 8 mm. longi. *Calyx* fere ad basin usque partitus, segmentis lineari-lanceolatis circiter 1 cm. longis pilis longiusculis ciliatis. *Corolla* infundibuliformis, intus antice lutea, ceterum azurea; tubus albus, calycem paulo excedens, bracteis aequilongus, intra calycem curvatus, extra et apice intus glanduloso-pilosus; limbus patulus 12 mm. latus. *Stamina* 2; filamenta 7 mm. supra basin tubi inserta; antherae postice barbatae; staminodia 3, quorum 2 filamentis fere aequilonga, alterum perbreve. *Discus* annularis. *Ovarium* pilis adpressis obtectum, 9 mm. altum, 1 mm. diametro; stylus stamina superans; stigma 2-lamellatum.—W. G. CRAIB.

A marked feature of the species of the natural family Gesneraceae to which the plant here figured belongs is their extremely limited distribution. This pleasing *Chirita* appears to be no exception to this rule, for it has so far only been met with on the limestone rocks of Lankawi which are, it appears, particularly rich in Gesneraceous plants; it is one of the many novelties met with by Mr. C. Curtis, in the course of his botanical investigation of this island, which lies off the coast of Kedah in the Malay Peninsula. It was introduced to European horticulture by Mr. H. N. Ridley, who communicated seeds to Kew from the Singapore Botanical Garden in 1905, the year in which he first published an account of the plant. As cultivated at Kew, in a moist tropical house, it is a bushy compact annual about 2 feet in height, which flowers freely and continuously during autumn. It is easily brought to perfection under the treatment suitable for Gloxinias and other tropical Gesneraceae.

Description.—*Herb*, erect and simple or branching from the base, 1–2 feet high; stems soon becoming glabrous. *Leaves* opposite, ovate, acute at the tip, often rather unequal and truncate, rounded or slightly cuneate at the base, serrate, 2–3 in. long, 1–2$\frac{1}{4}$ in. wide, membranous, slightly mealy beneath, hairy on both surfaces with several-celled hairs which are longer above than below, lateral nerves about 10 on each side, somewhat raised beneath; petioles 2–2$\frac{1}{2}$ in. long, channelled above. *Peduncles* axillary, solitary or paired, each 4–8-flowered, $\frac{1}{3}$–1$\frac{1}{2}$ in. long; bracts connate in a hairy cup with a crenately toothed margin. *Pedicels* glabrous, about $\frac{2}{3}$ in. long. *Calyx* divided nearly to the base into 5 linear-lanceolate lobes about 5 lin. long which are ciliate with longish hairs. *Corolla* funnel-shaped; limb bright blue with a yellow blotch in front within, spreading, $\frac{2}{3}$ in. across; tube white, somewhat curved below, as long as the bracts and rather longer than the calyx, glandular hairy outside and at the mouth within. *Stamens* 2; filaments inserted about $\frac{1}{2}$ in. above the base; anthers bearded behind; staminodes 3, the lateral nearly as long as the filaments, the central very short. *Disk* annular. *Ovary* beset with adpressed hairs; over $\frac{1}{2}$ in. long, only $\frac{1}{2}$ lin. wide; style longer than the stamens; stigma 2-lobed.

Fig. 1, part of a leaf, under side; 2, calyx and pistil; 3, pistil, portion of calyx removed; 4, corolla, laid open; 5 and 6, anthers; 7, an anther-hair:—*all enlarged.*



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TAB. 8334.

TRISTELLATEIA AUSTRALIS.

Malaya and Australasia.

MALPIGHIACEAE. Tribe HIREAE.
TRISTELLATEIA, *Thouars*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 258.

Tristellateia australis, *A. Rich. Sert. Astrolab.* p. 38, t. 15; foliis ovatis vel ovato-oblongis acutis basi saepius rotundatis glabris aspectu laurino, alis fructuum anguste oblongis distincta.

Frutex scandens, altus. *Ramuli* conspicue lenticellati, juniores pilis medifixis sparse puberuli, seniores glabri, floriferi penduli. *Folia* opposita, ovata vel ovato-oblonga, apice acuta, recurva, basi plerumque rotundata, leviter complicata, 5–10 cm. longa, 2·5–5·5 cm. lata, opaca, glabra, supra nervis lateralibus quam mesophyllo pallidioribus venulis inconspicuis, subtus crebre reticulata costa satis prominente; nervi laterales utrinque 4–5, arcuati; petioli 0·7–2 cm. longi, conspicue sulcati, puberuli, marginibus minute serrulatis; stipulae subulatae, acutae, vix 1 mm. longae, petiolo leviter adnatae. *Racemi* 5–15 cm. longi, 12–16-flori, floribus oppositis pedunculatis: pedunculi 6–7 mm. longi; apice bibracteati, bracteis minutis subulatis; pedicelli singuli, 1·3–1·5 cm. longi, sursum incrassati. *Alabastra* breviter cymbiformia latere postico concavo, quinquecostata. *Sepala* erecta, oblonga, 2·5 mm. longa, 1·5 mm. lata, eglandulosa. *Petala* aestivatione ascendenti-imbricata, oblonga vel ovato-oblonga, 1·1–1·2 cm. longa, apice obtusa, basi truncata vel subcordata, ungue 2 mm. longo. *Stamina* 10, quorum 5 antipetala longiora; filamenta basi breviter connata, in alabastro flava, mox rubescentia, post lapsum antherarum intense rubra, antipetala 4 mm. longa, crassa, antisepala 2 mm. longa, pro rata gracilia; antherae oblongae, breviter rostratae, 2–2·5 mm. longae, poris duabus terminalibus dehiscentes. *Ovarium* hexagono-globosum, circiter 2 mm. diametro, 3-loculare, lateribus antilocularibus cristatis, lateribus interlocularibus sericeo-pilosis; styli 3, inaequales, quorum unus 7 mm. longus, secundus duplo minor, tertius minimus; ovula solitaria, pendula. *Fructus* tricocci, coccis circiter 8-alatis, alis anguste oblongis.—*T. australasica*, A. Juss. Monogr. Malpigh. p. 241; Benth. Fl. Austr. vol. i. p. 286; Hook. f. Fl. Brit. Ind. vol. i. p. 418. *Platynema laurifolium*, Wight et Arn. in Edin. New Phil. Journ. vol. xv. 1833, p. 179.—T. A. SPRAGUE.

The plant here figured was raised at Kew from seeds received in 1902 from the Botanic Garden, Singapore. Its cultivation presents no difficulty and in the Palm House, where it is grown, it forms a strong climber with pendent shoots which in summer produce graceful terminal racemes of yellow flowers. The filaments, which in bud are yellowish, begin to assume a reddish tint when the petals expand and by the time the anthers have fallen become bright red and impart a characteristic appearance to the flowers. One of the most widely distributed members of the natural family Malpighiaceae, *Tristellateia australis* appears to be characteristic of the littoral flora met with on sea coasts from the Mascarenes to Melanesia. While,

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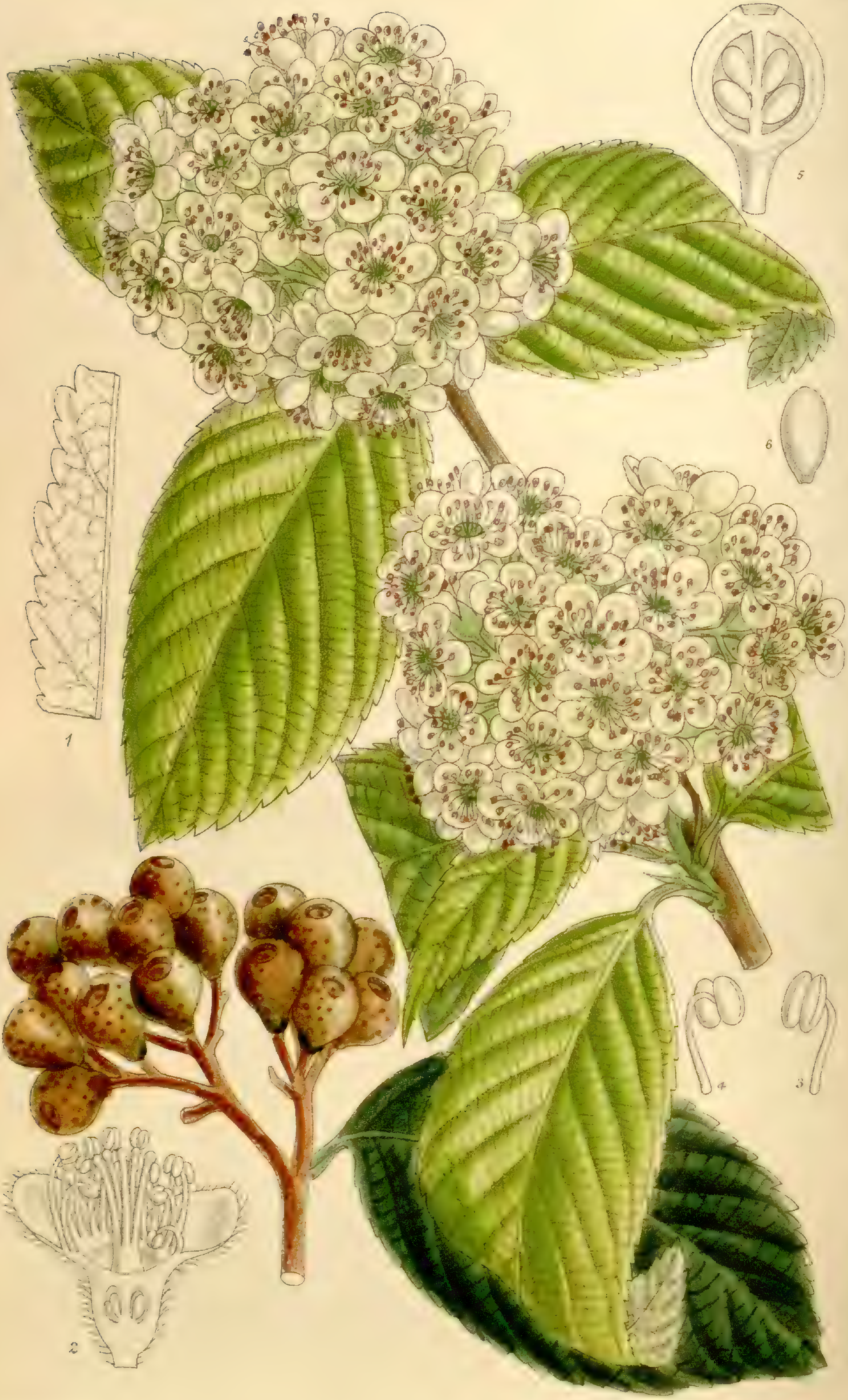
however, all save two of the nineteen species of *Tristellateia* hitherto described are natives of Madagascar or East Tropical Africa, *T. australis* appears to occur only in the eastern portion of this region; its most western habitats, so far as is known, are the Malayan Peninsula and Siam, whence it extends eastward through the Malayan Archipelago to Queensland, New Guinea, New Ireland, the Solomon Islands, New Caledonia, the Philippines and Formosa.

DESCRIPTION.—*Shrub*, climbing; twigs with prominent lenticels, at first sparingly puberulous with centrally attached hairs, at length glabrous; flowering shoots pendulous. *Leaves* opposite, ovate or ovate-oblong, acute and recurved at the apex, base usually rounded and somewhat folded, 2–4 in. long, 1–2¼ in. wide, dull, glabrous, lateral nerves above rather pale, secondary nervation indistinct, beneath closely reticulate with a rather prominent midrib; lateral nerves arching, 4–5 on each side; petioles ¼–¾ in. long, markedly channelled, puberulous, with slightly serrulate edges; stipules subulate, acute, slightly adnate. *Racemes* 2–6 in. long, 12–16-flowered, the flowers opposite, peduncled. *Buds* shortly cymbiform, concave behind, 5-ribbed; peduncles 3–4 lin. long, with 2 small apical subulate bracts; pedicels 6–8 lin. long, thickened upwards. *Sepals* small, erect, oblong, eglandular. *Petals* imbricate, oblong or ovate-oblong, 5–6 lin. long, obtuse, base truncate or subcordate, the claw 1 lin. long. *Stamens* 10, 2-seriate, those opposite the petals the longer; filaments shortly connate at the base, in bud yellow, soon becoming reddish and ultimately, after the anthers fall, deep red; those opposite petals 2 lin. long, stout; those opposite sepals 1 lin. long and more slender; anthers oblong, shortly beaked, about 1 lin. long, opening by terminal pores. *Ovary* globose, somewhat 6-angled, about 1 lin. wide, 3-celled; crested opposite the cells, silky hairy on the intervening areas; styles 3, unequal, one 3 lin. long, the second half as long, the third minute; ovules solitary, pendulous. *Fruit* 3-coccous; cocci about 8-winged, the wings narrow oblong.

Fig. 1, petioles; 2, flower, the petals partly removed; 3, a hair; 4 and 5, stamens; 6, pistil; 7, vertical section of pistil, showing the styles:—*all enlarged.*



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TAB. 8335.

MICROMELES CALONEURA.

Western China.

ROSACEAE. Tribe POMEAE.

MICROMELES, *Decne*; *C. K. Schneider, Handb. d. Laubholzk.* vol. i. p. 700.

Micromeles caloneura, *Stapf in Kew Bull.* 1910, p. 192: species ex affinitate *M. Schwerinii*, C. K. Schneider, foliis infra viridibus subglabris serratura minus inaequali et minus acuta, inflorescentia multo minus villosa, floribus majoribus, sepalis latis obtusis, stylis 5, fructibusque majoribus distincta.

Arbor mediocris vel *frutex*; rami glabri, cortice subnitido nigro-castaneo obtecti, parce lenticellati, tandem transverse rugosi. *Gemmae* hibernantes ovoidei extra glabri; perulae intus fulvo-pilosae et ex axillis pilis fulvis stipatae. *Folia* elliptico- vel obovato-oblonga, acuta vel rarius acuminata vel interdum obtusiuscula, basi subacuta, duplicato-serrato-crenata, crenis nervos laterales primarios recipientes quam caeteris plerumque majoribus, 6–9 cm. longa, 3–4·5 cm. lata, firme herbacea, decidua, supra glaberrima, demum saturate viridia, infra pallida, secundum nervos saltem ad eorum axillas parce villosula, nervis lateralibus subrectis eximie parallelis utrinque 10–12 supra eleganter impressis infra prominentibus, venis transversis areolisque tenuissimis; petioli 12 mm. longi, primo laxe pilosi, mox glabri, anguste canaliculati; stipulae subfiliformes, 6–8 mm. longae, pilosae, mox deciduae. *Flores* 6 mm. diametro plerumque in ramis abbreviatis in corymbos multifloros dispositi; ramuli et pedicelli bracteisque caducissimis filiformibus laxe villosuli. *Receptaculum* turbinatum, pilosulum. *Sepala* late ovata, obtusa, vix 2 mm. longa, villosula. *Petala* alba, late obovata, 5 mm. longa. *Stamina* circiter 20; antherae violaceo-purpureae. *Styli* 5, inferne connata. *Fructus* globoso-pyriformis, brunneus, lenticellatus, 8–10 mm. longus.—O. STAPF.

The genus *Micromeles* is already represented in gardens by two beautiful species, *M. alnifolia*, Koehne, and *M. Folgneri*, C. K. Schneider; the former of these has already been figured at t. 7773 of this work. To these the species now figured will prove a welcome addition. It was first met with by Mr. A. Henry in North Wushan, Szechuen, in 1889, and was again collected by Mr. E. H. Wilson in the same general region, in woods at 8000 feet above sea-level, in 1904. From seeds sent by Wilson to Messrs. James Veitch and Sons plants have been raised in their nursery at Coombe Wood and from one of these, which flowered for the first time in 1909, the material for our plate has been derived. *M. caloneura* has proved perfectly hardy and has thriven well in cultivation, and, while it is as yet premature

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to pronounce definitely with regard to its propagation, the fact that it has fruited within five years of the sowing of the seed seems to indicate that this should prove easy.

DESCRIPTION.—*Tree* or *shrub*; branches glabrous, bark almost shining, dark chestnut, sparingly lenticelled, ultimately transversely wrinkled. *Resting-buds* ovoid, glabrous; scales tawny hirsute within and with axillary tufts of tawny hairs. *Leaves* elliptic- or obovate-oblong, acute or rarely acuminate or at times bluntish, base subacute, margin twice serrate-crenate, the notches in which the primary nerves end rather larger than the rest, 2½–3½ in. long, 1¼–1¾ in. wide, firmly herbaceous, deciduous, quite glabrous and at length deep green above, pale beneath, and sparingly hairy on the nerves, at least at their points of origin; lateral nerves 10–12 on each side, nearly straight and markedly parallel, finely impressed above, prominent beneath, transverse veinlets very slender; petioles ½ in. long, at first loosely hairy, soon glabrous, narrowly channelled; stipules almost filiform, 3–4 lin. long, hairy, soon deciduous. *Flowers* ¼ in. across, in many-flowered corymbs on short twigs; the branchlets, pedicels and the filiform caducous bracts loosely pubescent. *Receptacle* turbinate, somewhat hairy. *Sepals* wide ovate, obtuse, under 1 lin. long, rather hairy. *Petals* white, wide obovate, 2½ lin. long. *Stamens* about 20; anthers violet-purple. *Styles* 5, connate below. *Fruit* globose-pyriform, brown, lenticelled, 4–5 lin. long.

Fig. 1, margin of leaf; 2, vertical section of a flower, the petals removed; 3 and 4, stamens; 5, vertical section of a fruit; 6, seed:—*all enlarged.*

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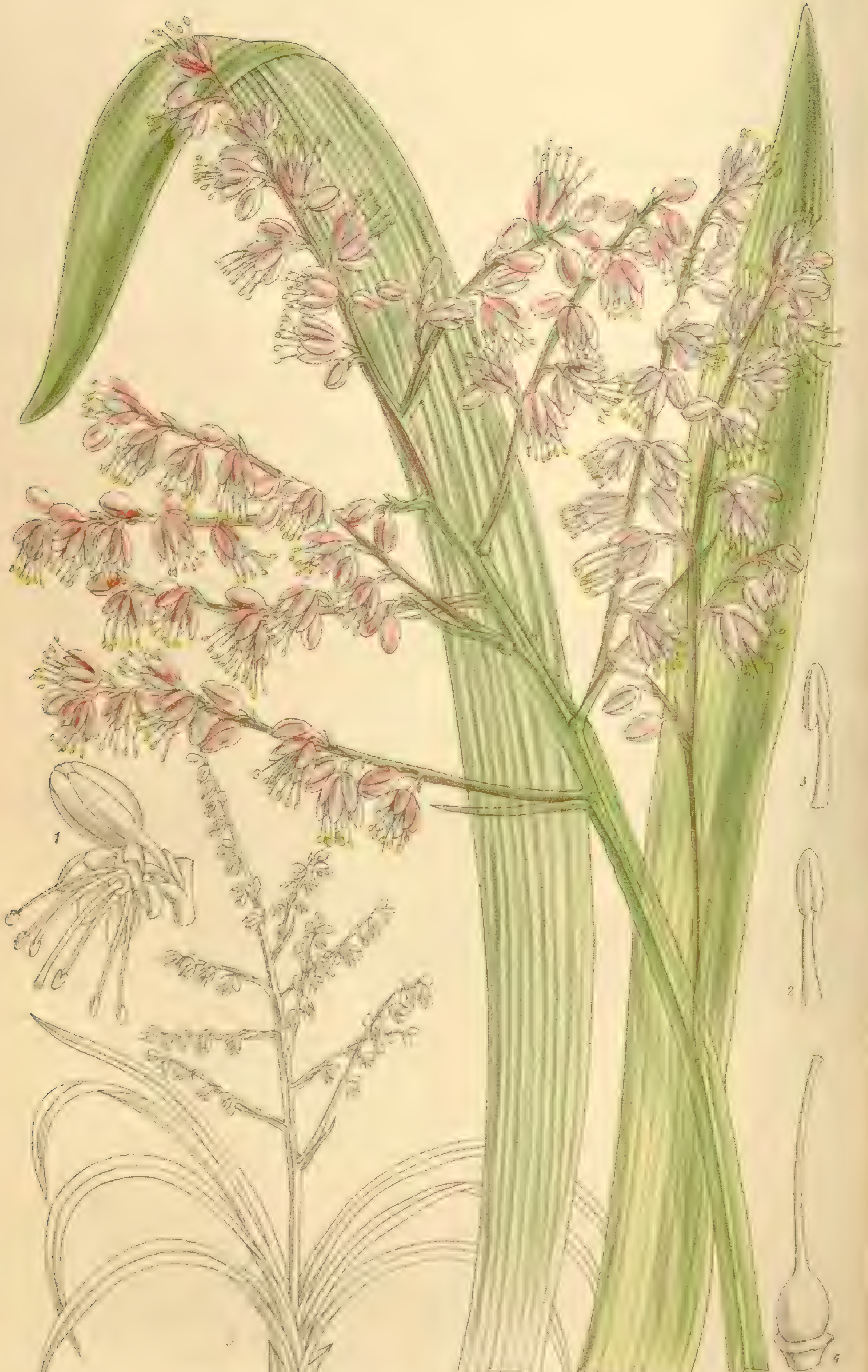

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TAB. 8336.

ALECTORURUS YEDOENSIS.

Japan.

LILIACEAE. Tribe ASPHODELEAE.

ALECTORURUS, *Makino in Bot. Mag. Tokyo*, vol. xxii. p. 14.

Alectorurus yedoensis, *Makino in Bot. Mag. Tokyo*, vol. xxii. p. 16; species unica.

Herba perennis, glabra. *Rhizoma* breve, crassum. *Folia* 6–11, caespitosa, disticha, falcato-ensiformia, obtusa vel subacuta, firma, laevia, 11–55 cm. longa, 0·7–2·5 cm. lata, supra vaginam articulata; costa inconspicua. *Scapus* aphyllus, 25–70 cm. longus, compressus, saepe anguste alatus; panicula pyramidalis; flores ad ramos racemosim dispositi, dimorphi, alii staminibus longe exsertis, alii staminibus perianthio aequilongis; bracteae anguste lanceolatae, 2 mm. longae; bracteolae minutae, e basi lato cuspidatae; pedicelli supra medium articulati. *Perianthium* campanulatum, dilute roseum; segmenta 6, 2-seriata, basi breviter connata, florum staminibus exsertis oblonga, concava, obtusa, leviter carinata, uninervia, 5 mm. longa; florum staminibus inclusis late elliptica, 3 mm. longa. *Stamina* 6; filamenta 3 vel 10 mm. longa; antherae dorsifixae, ovatae, basi cordatae. *Ovarium* trilobum, glabrum; stylus stamina longiora superans, staminibus brevibus aequilongus; stigma minutum; ovula 2, collateralia, ascendentia. *Capsula* loculicida. *Semina* oblonga, trigona, basi pilis longis albis instructa.—*Anthericum yedoense*, Maxim. ex Franch. et Sav. Enum. Pl. Jap. vol. ii. pp. 83, 529. *Bulbinella yedoensis*, Matsum. in Bot. Mag. Tokyo, vol. xv. 39, et Ind. Pl. Jap. vol. ii. pars i. p. 192. *Dianella* sp., Sav. in Som. Zusetz. ed. 2, vol. vi. n. 46.—C. H. WRIGHT.

The graceful Asphodeline here figured, which is known in Japan, where it is a native, as the Keibi-ran, or Keibi "orchid," has given some little trouble to students of Japanese plants. The late Dr. Savatier, dealing with a good Japanese figure of the species, at first thought that it might be a *Dianella* but subsequently abandoned this opinion in favour of that of the late Mr. Maximowicz who treated it as an *Anthericum*; it is under the name *Anthericum yedoense*, bestowed on the plant by this eminent botanist, that the plant is generally known in gardens. Professor Matsumura, with ample reason, at a later date removed the plant from *Anthericum*, but, as Mr. Makino has more recently shown, Matsumura's belief that our plant

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is a *Bulbinella* is not really more tenable than the suggestion of Savatier or of Maximowicz, and there is hardly room for doubt that the most satisfactory course is to adopt Makino's view and to consider it the type of a genus apart. The flowers are dimorphic, each plant bearing one kind only; in one group the stamens are twice as long as the perianth; in the other the stamens are not exserted. It is not improbable that this divergence may be of sexual significance and it has been suggested that the long-staminate form, here figured, may be the male. The plant from which our plate has been prepared was presented to Kew in 1901 by Mr. A. K. Bulley, Ness, Neston, Cheshire. At Kew it does not flower freely but is quite hardy, and forms, when in flower in July, an elegant tuft. The treatment most suitable for it is that which is also suitable for hardy species of *Anthericum.*

DESCRIPTION.—*Herb*, perennial, with a short thick rootstock; all parts glabrous. *Leaves* 6–11, tufted, distichous, falcate-ensiform, obtuse or subacute, firm, smooth, 4–20 in. long, $\frac{1}{3}$ lin. wide, articulate with the sheath, midrib hardly distinguishable from the remaining nerves. *Scape* naked, 10–30 in. long, compressed and often narrowly winged, bearing a pyramidal panicle. *Flowers* racemosely set along the panicle-branches, dimorphic, some with far exserted stamens, others with the stamens only equalling the perianth-segments; bracts narrow lanceolate, 10 lin. long; bracteoles very small, cuspidate from a broad base; pedicels jointed above the middle. *Perianth* campanulate, pale rose; segments 6, 2-seriate, shortly united at their bases; those of the long-staminate flowers oblong, concave, obtuse, faintly keeled and 1-nerved, $2\frac{1}{2}$ lin. long; those of the short-staminate flowers wide elliptic, $1\frac{1}{2}$ lin. long. *Stamens* 6; filaments $1\frac{1}{2}$ lin. long in one form, 5 lin. long on the other; anthers dorsifixed, ovate, their bases cordate. *Ovary* 3-lobed, glabrous; style in the long-staminate form longer than the stamens; in the short-staminate form as long as the filaments; stigma minute; ovules 2, collateral, ascending. *Capsule* loculicidal. *Seeds* oblong, 3-gonous, with a basal tuft of long white hairs.

Fig. 1, flowers; 2 and 3, stamens; 4, pistil; 5, sketch of an entire plant, showing habit:—*all enlarged, except 5, which is much reduced.*

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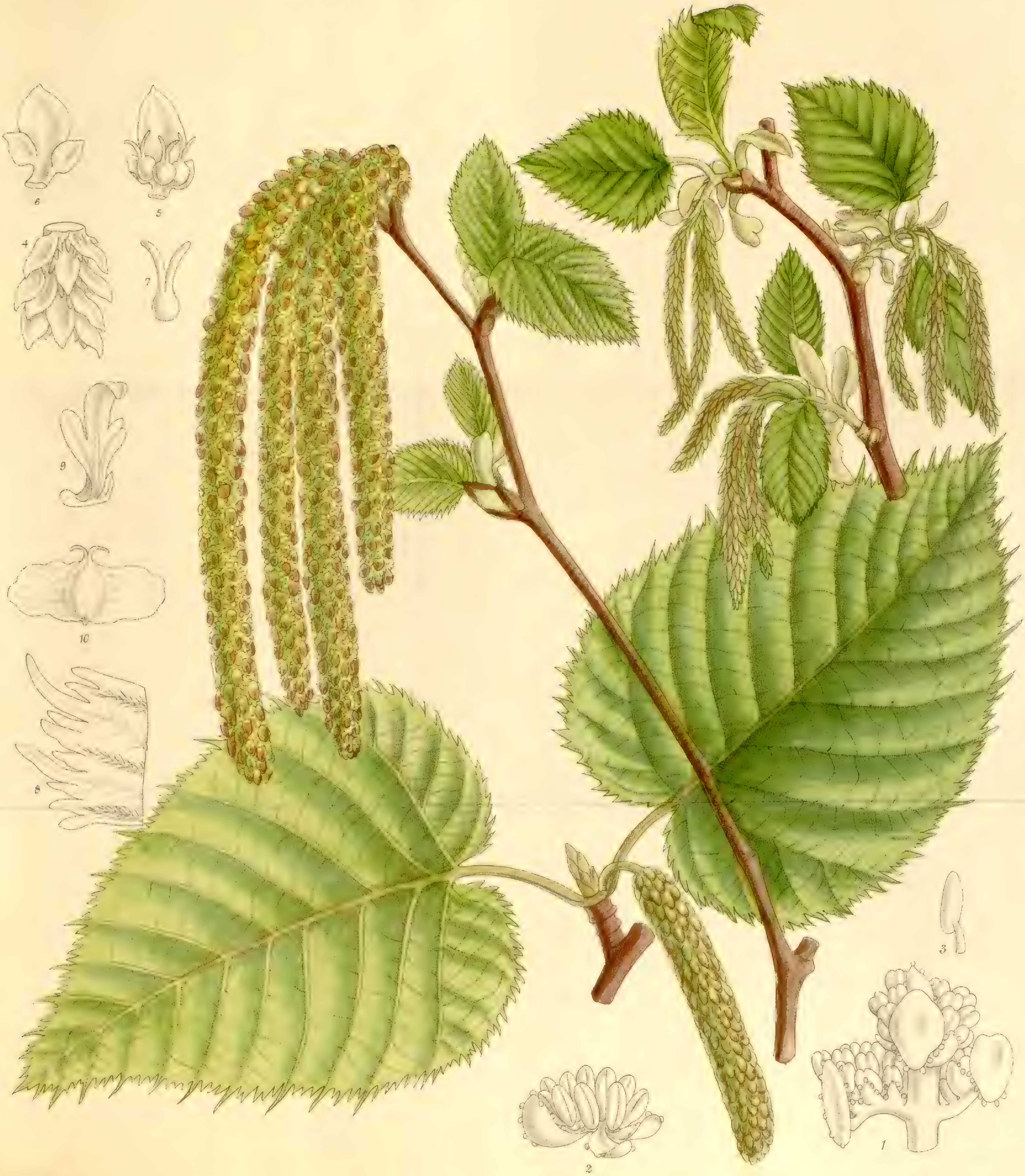
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Tab. 8337.

BETULA Maximowiczii.

Japan, Saghalien and Manchuria.

Cupuliferae. Tribe Betuleae.

Betula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 404.

Betula (Betulaster) **Maximowiczii**, *Regel in Bull. Soc. Nat. Mosc.* vol. xxxviii. pars ii. p. 418, t. 6, ff. 1–8; *Winkler in Engl. Pflanzenr., Betulaceae*, p. 89, f. 22, D–F; *Bailey, Cyclop. Amer. Hort.* vol i. p. 158; *Elwes & Henry, Trees of Great Brit. & Ireland*, vol. iv. p. 976, t. 269, f. 6; species distinctissima, foliis ad 15 cm. longis basi profunde cordatis, amentis femineis 2–4 elongatis in racemos dispositis.

Arbor interdum ad 30 m. alta; truncus 0·5–1 m. diametro, cortice papyraceo pallide aurantiaco vel griseo; ramuli fere glabri, cortice nitente brunneo sparse lenticellato. *Folia* late ovata, 8–15 cm. longa, 6–9 cm. lata, apice breviter et abrupte acuminata, basi profunde cordata, glanduloso-serrata vel biserrata, laete viridia, supra primo pilis erectis vestita, demum glabrescentia, infra ubique sparse pubescentia vel costa et venis primariis pubescentibus exceptis glabra, glanduloso-punctata; venae laterales utrinque 10–12 in dentes ceteris longiores exeuntes; petioli 2–4 cm. longi, glabri vel pubescentes. *Amenta mascula* apice ramulorum fasciculata, anguste cylindracea, 8–12 cm. longa, bracteae rotundatae, breviter ciliatae, glandulis sessilibus paucis instructae. *Amenta feminea* 2–4 in racemos laxos disposita, anguste cylindracea, 3 cm. longa, fructifera 4–8 cm. longa, circiter 1 cm. lata; bracteae maturae glabrae, 4–5 mm. longae, circiter 2·5 mm. latae, 3-lobatae, lobis lateralibus leviter patentibus lobo intermedio multo brevioribus; nuculae vix 2 mm. longae, latissime alatae. —*B. Maximowicziana*, Regel in DC. Prodr. vol. xvi. sect. ii. p. 180; Shirai in Bot. Mag. Tokyo, vol. viii. p. 321, t. 6, ff. 36–38; Sargent, For. Fl. Japan, p. 62; Shirasawa, Ic. Ess. Forest. Japon, text. p. 45, t. 23, ff. 1–8; Mayr, Fremdländ. Wald- u. Parkbäume, p. 449 (*B. Maximowicsiana*).—S. A. Skan.

The handsome Birch which forms the subject of our plate is remarkable on account of its large and deeply cordate leaves which impart to the species a striking resemblance to some of the Lindens. It was originally met with by the lamented Mr. Maximowicz in the island of Yezo in Japan, in which country it was afterwards collected by Dr. Mayr on the Nikko mountains in Hondo. According to Professor Sargent it ranges northwards through Saghalien into Manchuria. In 1888 the late Mr. J. H. Veitch sent a supply of seed of this tree from Yezo to England, thus for the first time introducing it into Europe, where examples are now to be met with in many establishments. In 1893 Professor Sargent presented to Kew from the Arnold Arboretum a supply of seed received by him from the officers of the Imperial Forest Department of Yezo. From a plant

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raised at Kew from this seed the material on which our illustration is based was derived. *B. Maximowiczii* is a member of the small section *Betulaster* in which are included *B. alnoides*, Ham., *B. luminifera*, Winkler, and *B. Baeumkeri*, Winkler, all natives of the Himalaya or of Central and Southern China. The species included in this section are characterised by having the elongated fruiting catkins arranged in racemes, rarely solitary, and by their broad-winged nutlets. The only other Birch in which the leaves are distinctly cordate at the base is *B. ulmifolia*, Sieb. & Zucc.; from this *B. Maximowiczii* is easily distinguished by its larger, broadly ovate leaves. Dr. Shirasawa describes the wood of our tree as hard, and as showing no difference in the colour of the heart and the sap woods. In Japan, where it is known as Udai-kamba or Saihada-kamba, the timber is used for house-building; fishermen also make torches of the bark, which is said to take fire readily even when wet.

DESCRIPTION.—*Tree*, sometimes attaining a height of 100 feet; trunk 1½–3½ feet thick; bark pale orange or grey, papery; twigs nearly glabrous, with brown polished sparingly lenticelled bark. *Leaves* broadly ovate, 3–6 in. long, 2¼–3½ in. wide, shortly and abruptly acuminate, base deep cordate, margin glandular serrate or twice serrate, bright green, clothed above at first with erect hairs which soon disappear, beneath glandular punctate and uniformly sparingly pubescent or with pubescent midrib and nerves but glabrous elsewhere; lateral nerves 10–12 on each side ending in marginal teeth rather longer than the rest; petiole ¾–1½ in. long, glabrous or pubescent. *Male catkins* fascicled at the tips of short twigs, narrow cylindric, 3–4½ in. long; bracts rounded, shortly ciliate, with a few sessile glands. *Female catkins* 2–4 arranged in loose racemes, narrow cylindric, 1¼ in. long, in fruit 1¾–3 in. long and about 5 lin. wide; bracts when mature glabrous, 2–2½ lin. long, about 1¼ lin. wide, 3-lobed; lateral lobes somewhat spreading, much shorter than the mid-lobe; nutlets under 1 lin. long, wide winged.

Fig. 1, part of a male catkin; 2, male flowers; 3, anther; 4, part of a female catkin; 5, female flower; 6, bract of female flower; 7, pistil; 8, margin of mature leaf; 9, bract of fruiting catkin; 10, winged nutlet:—*all enlarged.*

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TAB. 8338.

ROSA MOYESII.

Western China.

ROSACEAE. Tribe ROSEAE.

ROSA, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 625.

Rosa Moyesii, *Hemsl. et E. H. Wilson in Kew Bull.* 1906, p. 159; species ex affinitate *R. macrophyllae*, a qua differt foliis aculeatis, foliolis creberrime serrulatis, floribus subsolitariis sanguineis et fructu majore cum calycis lobis persistentibus erectis circiter 6 cm. longo.

Fruter 2·5–3·5 m. altus; rami glabri parce aculeati, aculeis brevibus rectis basi dilatatis. *Folia* 7–13 foliolata, cum petiolo brevi 8–18 cm. longi, 4–7·5 cm. lati, rhachi gracillima aculeolata puberula simul inconspicue glandulosa; foliola praeter terminale subsessilia, tenuia, ovata, oblonga, elliptica vel interdum fere orbicularia, 0·5–3 cm. longa, deorsum gradatim minora, creberrime calloso-serrulata, praeter costam infra pilosulam utrinque glabra, subtus pallidiora; stipulae rubentes, latae, integrae, 1·5–2 cm. longae, minute ciliolato-glandulosae, parte libera deltoidea vix acuta. *Flores* saturate rubro-sanguinei, petalis extra pallidioribus, 4·5–6·5 cm. diametro, solitarii vel bini, erecti; pedunculi quam folia breviores glandulis longe stipitatis conspicue ornati. *Calyx* languide fusco-purpureus; tubus nudus vel glandulis stipitatis plus minusve vestitus; lobi 5, patentes, e basi ovata caudati, apice dilatati, foliacei, petala fere aequantes, intus tomentosi, extra in partibus aliis obtectis etiam primus tomentosi, rarius pauciglandulosi. *Petala* saepissime 5, fere orbicularia, emarginata, 2–3 cm. lata, explanata, sese leviter obtegentia. *Stamina* numerosissima, filamentis brevissimis, antheris fusco-flavis. *Carpella* 15–20, pilosa, libera, e tubo brevissime exserta. *Fructus* saturate rubro-aurantiacus, ampulliformis, cum calycis lobis nunc erectis 6–7 cm. longus, nonnunquam glandulis paucis stipitatis infra medium instructus; achaenia pilosula.—W. BOTTING HEMSLEY.

The strikingly beautiful Rose here figured is a native of the mountains of Szechuan, between Mount Omi and Tatienlu at elevations of from 7000–9000 feet above sea-level. It was first collected by Mr. A. E. Pratt and was subsequently met with by Mr. E. H. Wilson, who also secured ripe seeds on behalf of Messrs. J. Veitch & Sons, in whose nursery at Coombe Wood plants were raised which are now 6–8 feet high. From one of the original plants the flowers and fruits now depicted were supplied by Messrs. Veitch in June and in September, 1909. It may be remarked that in addition to the form here figured there is another with paler flowers which, though also beautiful, is less effective than that here shown. *R. Moyesii* will no doubt require the conditions that have been found to suit

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the great majority of roses; a sunny position and a good loamy soil inclining to be of a heavy rather than a light character. Such pruning as may be called for will have to take the form of a thinning out of the older wood; certainly not a general shortening back of the branches. It can be propagated by cuttings made in August and placed in gentle heat. Seeds will also be available, but having regard to the possibility of hybridisation it will be necessary that any seed collected be taken from plants isolated from other roses.

DESCRIPTION.—*Shrub*, 8–10 feet high; branches glabrous, sparingly prickly, prickles short straight with widened bases. *Leaves* with 7–13 leaflets, including the short petiole 3–7 in. long, 1½–3 in. wide, rachis very slender, puberulous, with also small prickles and minute glands; leaflets except the terminal almost sessile, thin, ovate, oblong, elliptic or at times almost orbicular, ¼–1¼ in. long, gradually smaller towards the basal pair, closely serrulate with thickened teeth, glabrous on both sides except on the slightly pilose midrib beneath, bright green above, paler beneath; stipules wide, entire, ½–¾ in. long, reddish, finely glandular-ciliate, the free tips deltoid, subacute. *Flowers* deep blood-red, the petals paler outside, 1¾–2½ in. across, solitary or in pairs, erect; peduncles shorter than the flowers, clothed with conspicuous long-stalked glands. *Calyx* faintly tinged with dull purple; tube naked or more or less clothed with stalked glands; lobes 5, spreading, caudate from an ovate base, leafy, almost as long as the petals, within tomentose, at first also hairy outside on the portions overlapped in bud by adjacent sepals, rarely slightly glandular. *Petals* usually 5, almost orbicular, emarginate, ¾–1¼ in. wide, explanate, slightly overlapping. *Stamens* very many, filaments very short, anthers tawny-yellow. *Carpels* 15–20, pilose, free, somewhat exserted from the tube. *Fruit* deep orange-red, ampulliform, crowned by the calyx lobes which become erect and including these 2¼–2½ in. long, sometimes sparingly clothed with stalked glands below the middle; achenes somewhat pilose.

Fig. 1, longitudinal section of a flower from which the calyx-lobes and petals have been removed; 2, a stamen; 3, a carpel; 4, a ripe fruit; 5 and 6, achenes:—*all, except* 2 and 5, *enlarged.*

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TAB. 8339.

STYRAX HEMSLEYANUS.

Central China.

STYRACACEAE.

STYRAX, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 669; *Perkins in Engl. Pflanzenr., Styracaceae,* p. 17.

Styrax Hemsleyanus, *Diels in Engl. Bot. Jahrb.* vol. xxix. p. 530; *Perkins* l. c. p. 70; affinis *S. glabrescenti,* Benth., sed foliis saepe denticulatis floribus minoribus plerumque in paniculis dispositis differt.

Arbor 6–10 m. alta, cortice albo insigne instructa (fide *A. Henry*); rami subteretes, primum stellato-tomentelli, demum glabri et cinereo-fusci. *Folia* alterna vel subopposita, ambitu polymorpha, plerumque late obovato-elliptica vel oblique ovata, apice obtusa vel subacuta, interdum breviter acuminata, basi rotundata vel subcuneata, 7–13 cm. longa, 4–10 cm. lata, tenuiter chartacea vel membranacea, denticulata, supra glabra, subtus costa nervisque parce stellatim pilosa ceterum glabra, nervis lateralibus 5–8 prope marginem anastomosantibus, nervis transversis subparallelis. *Inflorescentia* 8–15 cm. longa, racemosa vel paniculata, axillaris vel terminalis, 8–20-flora; rhachis adpresse stellatim rufo-tomentella, demum subglabra; bracteae minutae, tomentellae, caducae. *Flores* 1·5–2 cm. longi, 2–3 cm. diametro; pedicelli ad 5 mm. longi, stellato-tomentelli. *Calycis* tubus cupuliformis, 5–6 mm. altus, 4 mm. diametro, 5–6-dentatus, leviter costatus, extus rufo-stellato-tomentellus, dentibus acutis 1–2 mm. longis. *Corolla* alba, 5-partita; tubus 4–5 mm. longus, lobis imbricatis elliptico-lanceolatis 1–1·5 cm. longis 5–7 mm. latis submembranaceis utrinque adpresse albido-stellato-tomentellis. *Stamina* 10, corollae lobis breviora, filamentis complanatis cum antheris parce stellato-pilosis. *Ovarium* ovoideum, dense albo-tomentosum, triloculare, multiovulatum; stylus glaber, corollae lobis paulo brevior. *Fructus* obovoideus, 2 cm. longus, 1·3 cm. diametro, exocarpio tomentello, stylo basi persistente breviter mucronatus, calyce persistente.—J. HUTCHINSON.

The *Styrax* here figured was discovered by Mr. A. Henry in Szechuan and Hupeh in 1888, and again met with in Szechuan by Mr. E. H. Wilson, who sent seeds to Messrs. J. Veitch & Sons. From a plant raised from these seeds, now a vigorous small tree of slender pyramidal form and about 9 feet high, in the Coombe Wood Nursery, which flowered in June, 1909, the material for our figure was derived. The leaves are of a pale bright green, and of striking size. Henry notes this species as being, in a wild state, 30 feet high, with white, fragrant flowers and remarkable white bark. It bears a general resemblance in habit and flower to *S. Obassia*, Sieb. & Zucc., a Japanese species sometimes met with in collections, figured at t. 7039 of this work, but differs from that species in

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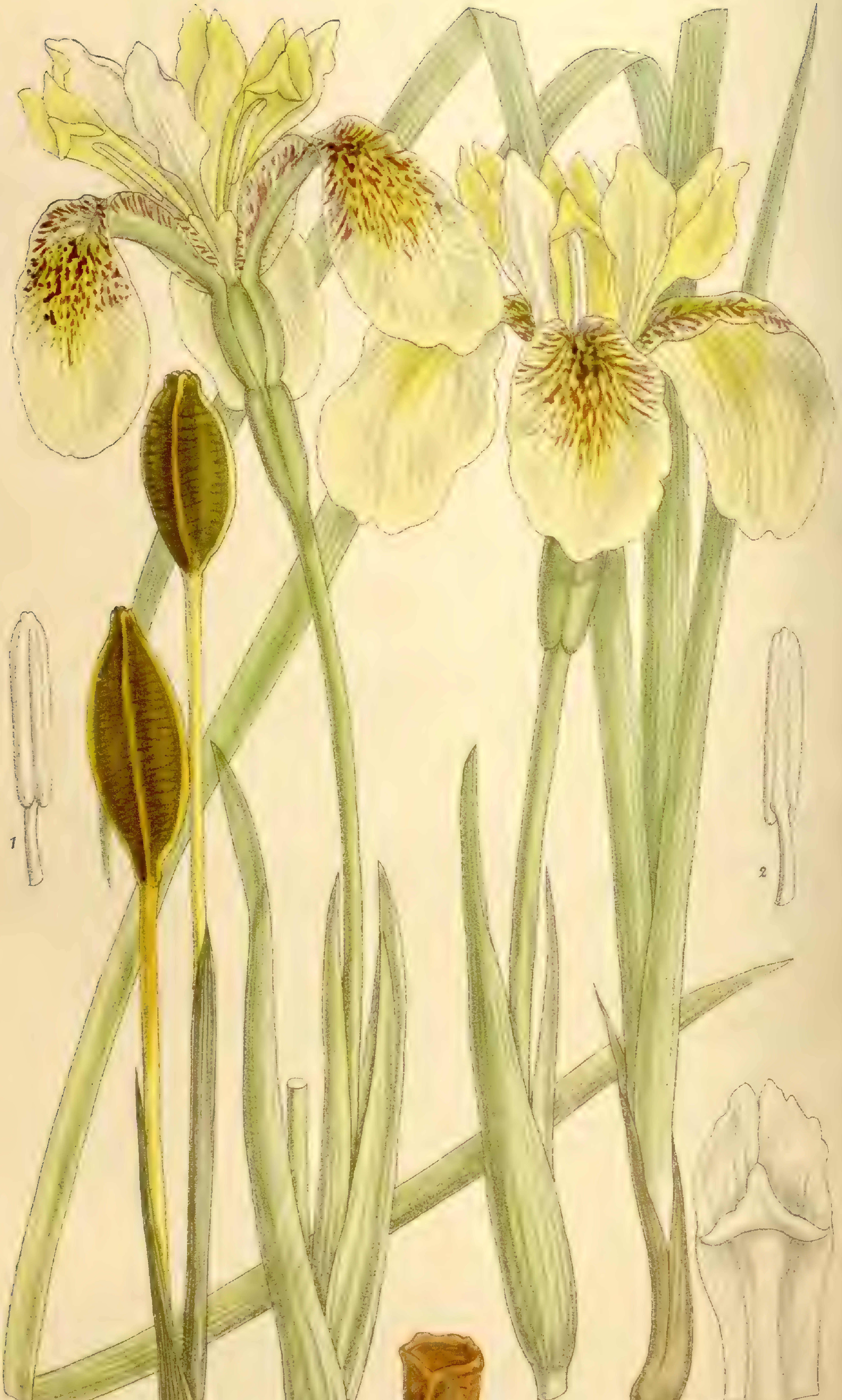
that the bud is not enclosed by the base of the petiole, the leaves are nearly always contracted at the base, more finely toothed and glabrous or nearly so underneath, while the inflorescence is branched at the base and the fruits are abruptly contracted and mucronate at the tip. *S. Hemsleyanus* is not closely related to any species from Eastern Asia; its nearest ally appears to be the Mexican *S. glabrescens*, Benth. It thrives well in open loamy soil and promises to be hardy; for young plants, a proportion of one-third peat added to ordinary soil, about their roots, will probably be found advantageous.

DESCRIPTION.—*Tree*, reaching a height of 20–30 feet, with remarkable white bark; branches almost cylindric, at first slightly stellate-hairy, at length glabrous and tawny. *Leaves* alternate or almost opposite, usually wide obovate-elliptic or obliquely ovate, obtuse or subacute, occasionally shortly acuminate, base rounded or almost cuneate, ¾–5 in. long, 1¾–4 in. wide, rather thin, denticulate, glabrous above, beneath sparingly stellate-pubescent on midrib and nerves, elsewhere glabrous; main nerves 5–8 on each side anastomosing near margin, transverse veins nearly parallel. *Inflorescence* 3–6 in. long, racemose or almost paniculate, axillary or terminal, 8–20-flowered; rachis at first with a close stellate pubescence, at length nearly glabrous; bracts minute, tomentose, caducous. *Flowers* 8–10 lin. long, ¾–1¼ in. across; pedicels 2 lin. long, stellate-pubescent. *Calyx* cup-shaped, 5–6-toothed; tube 2½–3 lin. deep, 2 lin. wide, faintly ribbed, rusty stellate-tomentose outside; teeth acute, 1 lin. long or less. *Corolla* white, 5-partite; tube 2–3 lin. long; lobes imbricate, elliptic-lanceolate, 5–8 lin. long, 2½–3½ lin. wide, almost membranous, closely white stellate-tomentose without and within. *Stamens* 10, shorter than corolla lobes; filaments flattened, sparingly clothed, like the anthers, with stellate hairs. *Ovary* ovoid, densely white tomentose, 3-celled, many-ovuled; style glabrous, somewhat shorter than corolla lobes. *Fruit* obovoid, 10 lin. long, 6 lin. wide; exocarp somewhat pubescent; apex tipped with the persistent style-base; calyx in fruit persistent.

Fig. 1, calyx and pistil; 2, stellate hairs; 3, corolla, laid open, and stamens; 4 and 5, anthers; 6, pistil:—*all enlarged.*



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Tab. 8340.

IRIS Wilsonii.

China.

Iridaceae. Tribe Irideae.

Iris, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 686.

Iris Wilsonii, *C. H. Wright in Kew Bull.* 1907, p. 321; affinis *I. sibiricae*, Linn., sed pedicellis et spathis herbaceis longis, floribus plerumque luteis distincta.

Herba rhizomate brevi, collo ob vaginas vetustas solutas fibroso. *Folia* basalia 30-60 cm. longa, 5-6 (rarius ad 9) mm. lata, apice brevi oblique subincurvo, laete viridia, laevia, saltem inferne inaequaliter nervosa, nervis mediis 3–4 quam ceteris magis prominentibus et conspicuis. *Caulis* 20-30 cm. altus, cylindricus, 1-foliatus, folio circiter 15 cm. longo infra medium orto foliis basalibus simili, 2–1-florus. *Spathae* magis minusve herbaceae, una saepe in laminam perbrevem abiens, 6–10 cm. longae, 2–4 mm. latae. *Pedicelli* inaequales, longiores, ad 13 cm. longi. *Perianthii* tubus viridis, 8–10 mm. longus, obtuse trigonus; segmenta exteriora 4–5 cm. longa limbo reflexo oblongo- vel obovato-elliptico 1·5–2 cm. lato luteo infra medium purpureo-venoso, ungue quam limbo paulo breviore 7–9 mm. lato margines versus copiose purpureo-venoso; segmenta interiora oblongo-lanceolata in unguem gracilem attenuata, 2–3·5 cm. longa, 6–8 mm. lata, lutea. *Filamenta* 9-11 mm. longa; antherae albidae, 11–12 mm. longae. *Ovarium* obtuse triquetrum, sub anthesi 1·5–1·8 cm. longum; styli rami subspathulato-lineares, superne 7–8 mm. latae, luteae, cristae lobis late ovatis eroso-denticulatis; stigmate late triangulari. *Capsula* triquetra, oblonga, utrinque breviter attenuata, 3-3·5 cm. longa. *Semina* oblique triquetro-ovoidea, apice truncata, nigro-fusca, 4–5 mm. longa.—O. Stapf.

The Iris here figured was discovered by Mr. E. H. Wilson in Western China on behalf of Messrs. J. Veitch & Sons, and the material on which our figure is based was supplied from a plant which flowered with them in July, 1909. Another plant, presented by them to Kew, also flowered simultaneously in the Iris collection, where it has grown freely under the conditions suitable for the well-known *I. sibirica*, Linn., which it resembles in habit. It appears to be quite hardy, and promises to prove a useful addition to the list of garden Irises. In 1907 Mr. Wilson rediscovered this plant in Western Hupeh, growing in grasslands near Fang Hsien, at about 7000 feet above sea-level. But in addition to the form here figured there is another and nearly related form, which flowered with Messrs. Veitch in 1907, collected by Mr. Wilson on their behalf at Fang in Central China, of more robust habit and with wider spathes which extend as far as or beyond the top of the perianth-

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tube. This stouter form has been distinguished by Mr. Wright as a variety, var. *major*, of *I. Wilsonii*, but the venation of the leaves is somewhat different, and it may be necessary, when more ample material is available, to treat this robust plant as a distinct species. As gathered in a wild state and also under cultivation all the specimens of Mr. Wilson's two plants have pale yellow flowers. But it has to be remarked that in 1906 Mr. G. Forrest collected, on the eastern flank of the Tali range in Western Yunnan, an Iris with bright purplish-blue flowers as in *I. sibirica*, but which only differs from *I. Wilsonii* in other respects in having more finely acute leaves and wider perhaps less herbaceous spathes. This blue form is met with in mountain pastures at 10,000 feet above sea-level.

Description.—*Herb*, rhizome short, its apex crowned with the fibrous remains of the leaf-sheaths. *Leaves* at the base 1–2 feet long, 3–4 lin. wide, the tip short, slightly obliquely incurved, bright green, smooth, unequally veined at least in the lower portion, 3–4 of the nerves towards the centre more prominent than the others. *Stem* 8–12 in. high, 2- or 1-flowered, cylindric, 1-foliate, the leaf about 6 in. long and arising below the middle, like the basal leaves except as regards its size. *Spathes* somewhat herbaceous, one usually produced in a short blade, 2¼–4 in. long, 1–2 lin. wide. *Pedicels* unequal, the longer reaching 5 in. in length. *Perianth-tube* green, 4–5 lin. long, bluntly 3-gonous; outer segments nearly 2 in. long, with a reflexed, oblong- or obovate-elliptic limb 8–10 lin. long, veined with purple below the middle, claw somewhat shorter than the limb, 3–5 lin. wide, copiously veined with purple towards the edge; inner segments oblong-lanceolate, narrowed to a slender claw, ¾–1¼ in. long, 3–4 lin. wide, yellow. *Filaments* 5–6 lin. long; anthers whitish, rather longer than the filaments. *Ovary* bluntly 3-cornered, in flower 8–9 lin. long; style-arms subspathulate-linear, 3–4 lin. wide above, yellow, lobes of the crest wide ovate, erosely toothed; stigma wide triangular. *Capsule* triquetrous, oblong, slightly narrowed to both ends, 1¼–1¾ in. long. *Seeds* oblique, triquetrous-ovoid, truncate at the tip, dark-tawny, 2–2½ lin. long.

Figs. 1 and 2, anthers; 3, a lobe of the stigma; 4, fruit; 5, seeds:—*all, except* 4, *enlarged.*

M.S. del. J.N. Fitch lith.

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Tab. 8341.

PRIMULA Littoniana.

Western China.

Primulaceae. Tribe Primuleae.

Primula, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 631.

Primula Littoniana, *G. Forrest in Not. Roy. Bot. Gard. Edin.* 1908, pars xix. p. 225, cum icon.; ab affini *P. Viali*, Delavay ex Franch., partibus omnibus multo majoribus, calycis lobis tubo aequalibus, satis distincta videtur.

Herba perennis, 30–60 cm. alta. *Folia* omnia radicalia, anguste oblonga, obtusa, inferne longissime attenuata, ad 20 cm. longa, 7 cm. lata, irregulariter dentata, ciliata, utrinque pilosa, subtus praeterea in costa araneoso-pilosa, nervis secundariis utrinque numerosis, obliquis; petioli circiter 9 cm. longi. *Scapi* erecti, robusti, 40–60 cm. alti, folia longe superantes, basi glabri, supra parcissime farinosi, spicas simplices densas multifloras 7–12 cm. longas, 2·5–3·5 cm. diametro gerentes. *Flores* violaceo-coerulei, reflexi; bracteae lineares parce farinosae. *Calyx* late campanulatus vel globoso-campanulatus; tubus 2 mm. longus; lobi coccinei, ovato-lanceolati, subacuti, 4 mm. longi, 2·5 mm. lati. *Corollae* tubus circiter 1 cm. longus, 2 mm. diametro, calycem multoties superans; limbus concavus 6–8 mm. diametro, lobis late lanceolatis integris apice obtusis 4 mm. longis, 2·5 mm. latis. *Capsula* globosa, parva, calyce inclusa.—W. G. Craib.

The *Primula* here figured was collected in Yunnan by Mr. G. Forrest on behalf of Messrs. Bees, of Neston; the plant depicted was acquired from that firm in August, 1909. In Cheshire this species seems hardy, and plants grown in the open at Kew were uninjured by the frosts of the past winter. *P. Littoniana* belongs to a group of forms nearly allied to one sent to Paris by the late Père Delavay under the name *P. Viali*. It is not clear what the relationship of the different forms in this group may be. Mr. Franchet, who formally described Delavay's species, associated therewith a plant found in Szechuan by Père Soulie, which has bilobulate corolla segments in place of the entire lobes that characterise the plant named by Delavay. Messrs. Pax and Knuth refer to *P. Viali* yet another Primula collected by Mr. Ford in China. As regards the last-mentioned plant it has to be remarked that, in the Kew collection, Ford has included under the same field number two forms; one refer-

October, 1910.

able to *P. deflexa*, Duthie, but hardly distinguishable from the plant figured by Pax and Knuth as *P. Viali*, the other not distinguishable from the Eastern Himalayan *P. bellidifolia*, King. But Ford's two plants, though distinguishable, are so nearly related that his opinion, based on field observation, as to their specific identity may be correct; by parity of reasoning there is nothing improbable in the views of Pax and Knuth and of Franchet respectively, or in a suggestion that all these forms may be referable to one variable species first named *P. bellidifolia* by the late Sir George King. This being so, it is not surprising that so experienced a field observer as Mr. E. H. Wilson should consider the plant here figured to be only a strong form of *P. Viali*, Delavay. On the other hand, photographs of *P. Littoniana*, taken in the field, indicate a degree of uniformity among the particular plants involved that does not admit of being lightly put aside, so that, in spite of the fact that the differential characters pointed out by Mr. Craib are far from convincing, it is convenient, from the gardening standpoint, to treat *P. Littoniana* and *P. Viali*, for the moment, as distinct.

DESCRIPTION.—*Herb*, perennial, 1–2 feet high. *Leaves* all radical, narrow oblong, obtuse, much narrowed to the base, up to 8 in. long, 3 in. wide, irregularly toothed, ciliate, hairy on both surfaces and cobwebby beneath, especially along the midrib, secondary nerves many, oblique; petiole about 3½ in. long. *Scapes* erect, stout, 1½–2 feet high, rising far above the rosette, glabrous below, very sparingly mealy above, ending in dense, simple, many-flowered spikes which are 3–5 in. long and 1–1½ in. across. *Flowers* violet-blue, reflexed; bracts linear, sparingly mealy. *Calyx* wide campanulate or globose-campanulate; tube 1 lin. long; lobes pink, ovate-lanceolate, somewhat acute, 2 lin. long, 1¼ lin. wide. *Corolla* much larger than the calyx; tube about 5 lin. long, 1 lin. across; limb concave, 3–4 lin. across; lobes broadly lanceolate, entire, obtuse, 2 lin. long, 1¼ lin. wide. *Capsule* globose, small, enclosed in the calyx.

Fig. 1, flower; 2, section of calyx, showing pistil; 3, section of corolla, showing anthers; 4, sketch of an entire plant:- *all enlarged except 4, which is much reduced.*

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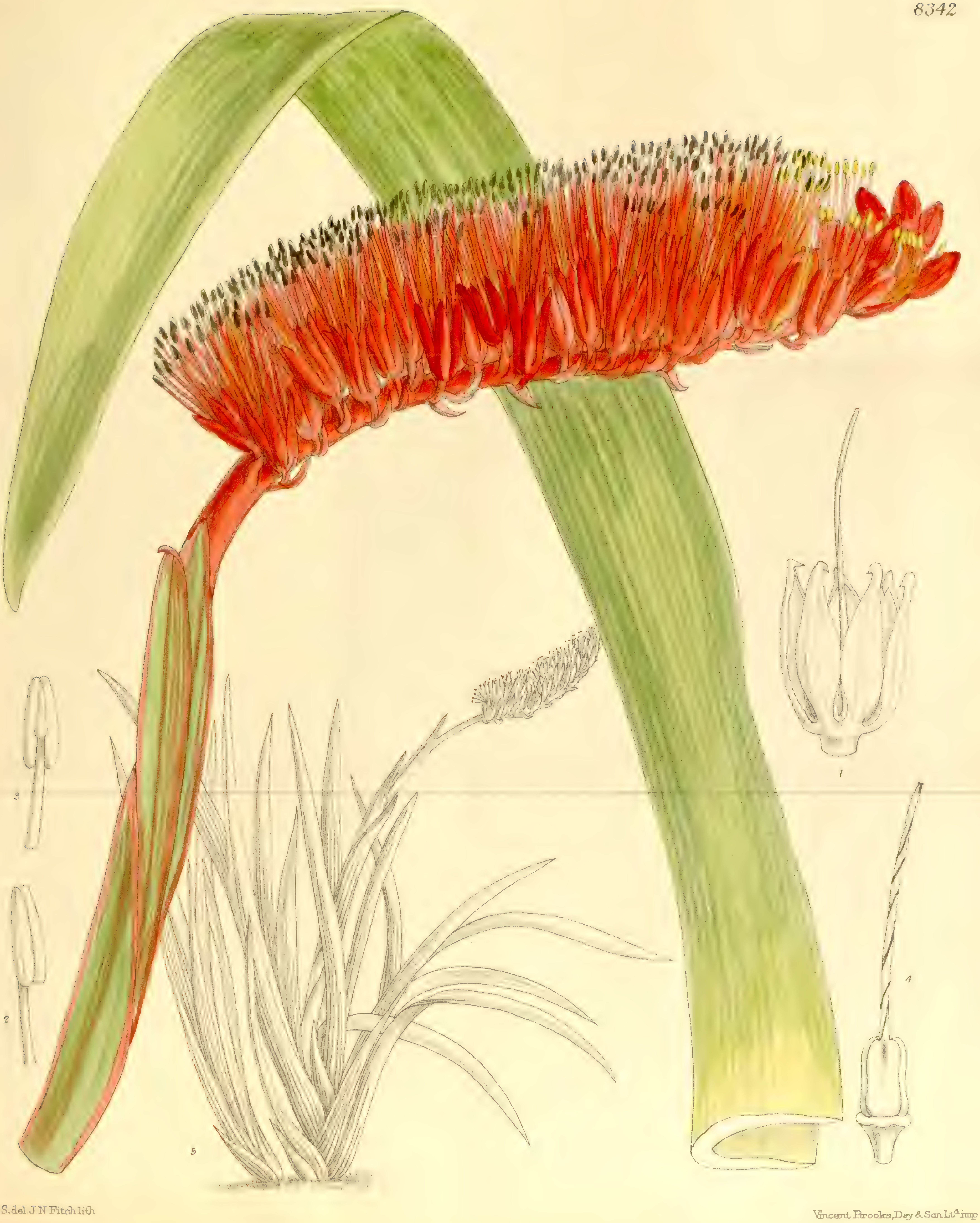

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TAB. 8342.

XERONEMA MOORII.

New Caledonia.

LILIACEAE. Tribe ASPHODELEAE.

XERONEMA, *Brongn. et Gris*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 781.

Xeronema Moorii, *Brongn. et Gris in Bull. Soc. Bot. France,* vol. xi. (1864), p. 316, *in Choix Pl. Nouv. Caled.* t. 1, et *in Nouv. Arch. Mus. Par.* vol. iv. p. 2, t. 1 (1868); species unica.

Herba; radice fibrosa, caule brevissimo. *Folia* disticha, vaginantia, ensiformia, lateraliter compressa, 40 cm. longa, 3 cm. lata, glabra, minute punctata. *Scapus* quam folia inferiora paullo longior; racemus 15 cm. longus, abrupte curvatus, rhachi horizontali; bracteae elongatae, vaginantes; flores secundi, erecti, rubro-purpurei; bracteolae scariosae, oblongae, breviter mucronatae, 1 cm. longae, 4 mm. latae; pedicelli 6 mm. longi. *Perianthii* segmenta 6, oblongo-lanceolata, apice anguste cucullata, persistentia, 15 mm. longa, 3 mm. lata, minute maculata. *Stamina* quam perianthium duplo longiora; filamenta rubro-purpurea, subulata; antherae oblongae, introrsae. *Ovarium* oblongum, trilobatum; ovula in quoque loculo 8–10; stylus subulatus, post anthesin spiraliter tortus; stigma parvum, obscure trilobum.—*X. Moorei,* André in Ill. Hort. 1877, p. 184, pl. 297; Ender in Gartenfl. 1878, p. 349; Reuthe in Gartenfl. 1889, p. 408, fig. 69. *Scleronema Moorii,* Brongn. et Gris in Ann. Sci. Nat. 5^{me} sér. vol. ii. p. 166.—C. H. WRIGHT.

The rather striking plant here described is a native of the mountains of New Caledonia, where it grows on volcanic rocks at elevations of from 3–5,000 feet above sea-level. It was originally discovered by Mr. C. Moore, Director of the Sydney Botanic Garden, and was introduced to European horticulture by Mr. J. Linden in 1875. The specimen from which our figure has been prepared was purchased for the Kew Collection from Messrs. J. Veitch & Sons in 1896. The distichous compressed leaves, sheathing at the base, impart to the species a facies recalling that characteristic of many of the *Iridaceae*; the flowers, however, are of a distinctly liliaceous type, and the genus *Xeronema*, to which our plant belongs, together with the Australasian genus *Herpolirion*, Hook. f., which has a quite different habit, constitutes the sub-tribe *Xeroneminae* of the *Asphodeleae* in the Natürlichen Pflanzenfamilien of Engler & Prantl. In cultivation it calls for the treatment most suitable for

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many South African bulbous plants; potted in a peaty soil and kept moderately moist all the year round. It enjoys bright sunshine and flowers annually in June. The perianth segments and filaments persist and retain their colour for a month or more. The subhorizontal direction assumed by the flower-bearing portion of the rachis and the curving of the pedicels so as to bring all the flowers into an approximately erect position are constant features which impart a characteristic aspect to the plant. *Xeronema Moorii* does not ripen seeds in this country; it may, however, be propagated by division.

DESCRIPTION.—*Herb*; stem very short, roots fibrous. *Leaves* distichous, sheathing at the base, ensiform, laterally compressed, 1½ feet long, 1¼ in. wide, glabrous, finely dotted. *Scape* rather longer than the lower leaves; raceme 6 in. long, abruptly bent to a nearly horizontal position; bracts elongated, sheathing; flowers secund, erect, reddish-purple; bracteoles scarious, oblong, shortly mucronate, 5 lin. long, 2 lin. wide; pedicels 3 lin. long. *Perianth* 6-lobed; lobes oblong-lanceolate, narrowly hooded at the tip, persisting, 8 lin. long, 1½ lin. wide. *Stamens* twice as long as perianth; filaments reddish-purple, subulate; anthers oblong, dark purple, introrse. *Ovary* oblong, 3-lobed; ovules 8–10 in each cell; style subulate, spirally twisted after the opening of the flower; stigma small, obscurely 3-lobed.

Fig. 1, flower; 2 and 3, anthers; 4, pistil; 5, sketch of an entire plant, showing habit:—*all enlarged except 5, which is much reduced.*

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TAB. 8343.

PLEIOCARPA MUTICA.

West Africa.

APOCYNACEAE. Tribe PLUMERIOIDEAE.

PLEIOCARPA, *Benth.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 699.

Pleiocarpa mutica, *Benth. in Hook. Ic. Pl.* t. 1181; *Stapf in Thiselton-Dyer, Fl. Trop. Afr.* vol. iv. pars i. p. 98; affinis *P. rostratae*, Benth., sed corolla multo breviore eius lobis brevibus et fructu haud rostrato ovoideo-globoso distincta.

Frutex, 1·5 m. altus, ramis fuscescentibus. *Folia* elliptica vel oblonga, abrupte acuminata, basi acuta vel subacuta, 8–16 cm longa, 3·5–6 cm. lata, tenuiter coriacea, supra lucida, nervis utrinque 11–14; petiolus 6 mm. longus. *Flores* in fasciculos globosos multifloros axillares dispositi, brevissime pedicellati. *Sepala* ovata, obtusa vel subacuta, ad 2 mm. longa. *Corolla* lactea, tubo cylindrico 12–16 mm. longo, lobis ovatis vel oblongis, obtusis, 6–7 mm. longis. *Carpella* 5, uniovulata. *Fructus* baccati, ovoideo-globosi, obtusi vel apiculati, rugosi, 8 mm. longi.—*Hunteria pleiocarpa*, Hallier f., Kautschuklianen in Jahrb. Hamburg. Wissensch. Anstalt. vol. xvii. (1899) 3. Beih. p. 193, partim.—O. STAPF.

The genus *Pleiocarpa*, to which the subject of our plate belongs, is endemic in Tropical Africa, from which region twelve species have so far been reported. The one here figured, *P. mutica*, is a native of the Cameroons, where it was first met with by Mr. G. Mann. It has since been found in Old Calabar, whence it has been introduced to European horticulture. The material made use of in preparing our illustration has been derived from a plant which flowered at Kew in June, 1909; this plant was raised from a cutting received from the Glasgow Botanic Garden in 1902. It has thriven well in a stove under the tropical conditions suitable for species of *Ixora*, and is striking from the cultural standpoint owing to the profusion of its beautiful white flowers. From the morphological point of view it is interesting on account of the presence in the flower of five carpels. This peculiarity it shares with another species, *P. rostrata*, Benth., while in a third species, *P. salicifolia*, Stapf, there are three or four carpels. The remaining species of *Pleiocarpa* have only two carpels, which is the number characteristic of the order Apocynaceae.

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DESCRIPTION.—*Shrub*; 5 feet high; branches somewhat tawny. *Leaves* opposite, elliptic or oblong, abruptly acuminate, base cuneate, 3–6 in. long, $1\frac{1}{2}$–$2\frac{1}{4}$ in. wide, thinly coriaceous, shining above, nerves 11–14 on each side; petiole 3 lin. long. *Flowers* shortly pedicelled, in axillary many-flowered globose clusters. *Sepals* ovate, obtuse or subacute, about 1 lin. long. *Corolla* pure white; tube cylindric, 6–8 lin. long; lobes ovate or oblong, obtuse, 3–$3\frac{1}{2}$ lin. long. *Carpels* 5, each 1-ovuled. *Fruit* berry-like, ovoid-globose, obtuse or apiculate, rugose, 4 lin. long.

Fig. 1, an unopened flower; 2, calyx and pistil; 3, vertical section of corolla; 4 and 5, anthers; 6, ovary; 7, section of ovary:—*all enlarged.*

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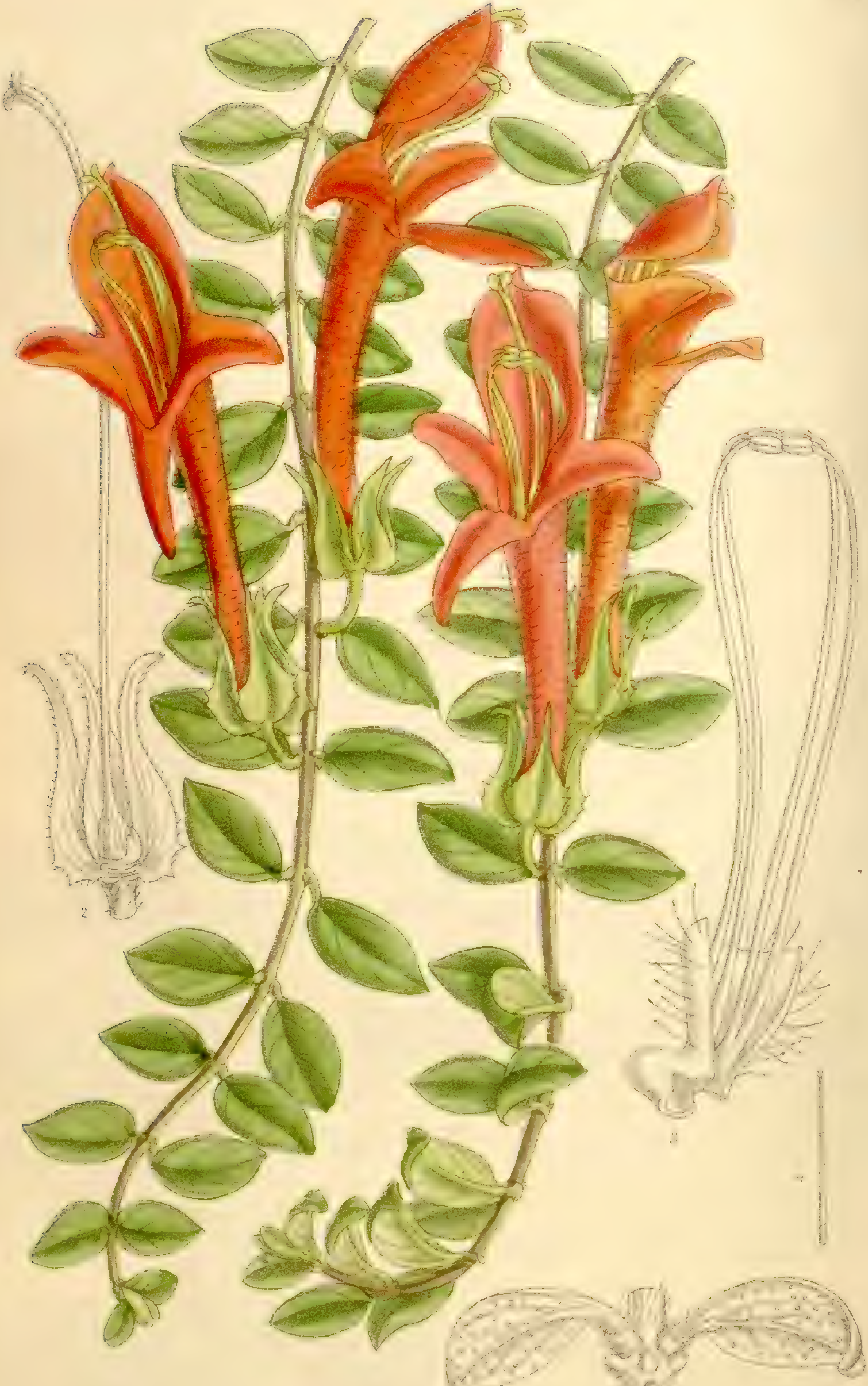

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Tab. 8344.

COLUMNEA Oerstediana.

Costa Rica.

Gesneraceae. Tribe Cyrtandreae.

Columnea, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1009.

Columnea Oerstediana, *Klotzsch ex Oerst. Centralam. Gesner.* p. 61, t. 8; *Hanst. in Linnaea*, vol. xxxiv. p. 407; affinis *C. microphyllae*, Klotzsch & Hanst., a qua foliis supra glabris subtus minute puberulis recedit.

Suffrutex vel *herba* epiphytica caule lignoso subtetragono fuscescente glabro nitidulo ramoso, ramis elongatis, teste Oersted strictis patenti-arrectis, indivisis superne sparse appresse pubescentibus, internodiis 1–1·7 cm. longis. *Folia* opposita, breviter petiolata, late ovata vel ovato-oblonga, apice acuta vel subacuta, basi obtusa vel rotundata, 1–1·5 cm. longa, 7–10 mm. lata, carnosa, supra convexa, saturate viridia, nitidula, glabra, subtus pallida, minute appresse puberula; nervi laterales utrinque 3–4, valde obliqui, subtus conspicui; petioli 2–3 mm. longi. *Flores* axillares, solitarii, erecti. *Pedunculus* circiter 1 cm. longus. *Sepala* erecta, valde imbricata, ovata, caudato-acuminata, inferne repando-dentata, ultra 1·5 cm. longa, 7 mm. lata, extra appresse puberula. *Corolla* coccinea, in toto circiter 7 cm. longa, bilabiata, extra pilis articulatis sparse villosa; tubus angustus, faucem versus sensim ampliatus, 4–4·5 cm. longus, inferne postice gibbosus; labium posticum galeiforme, apice rotundatum vel subcuspidatum; lobi laterales patentes, triangulares, cum galea alte connati; lobus anticus reflexus, lineari-lanceolatus, circiter 1·7 cm. longus. *Stamina* 4, exserta; filamenta glabra; antherae in quadram cohaerentes. *Disci* glandula unica, postica, emarginata. *Ovarium* appresse pubescens; placentae bilamellatae.—T. A. Sprague.

The *Columnea* here described, a native of Costa Rica, like its congener, *C. magnifica*, Klotzsch & Hanst., figured at t. 8225 of this work, does not appear to have been collected since its first discovery fifty years ago. This suggests that many of the Central American Gesnerads may have a limited distribution, and that further exploration of this region may lead to the introduction of forms that are as yet unknown. The plant on which our plate is based flowered in February, 1910, in the collection of Col. R. H. Beddome, Sispara, West Hill, Putney. This plant was a young cutting rooted in a propagating frame and grown in a small pot kept close to the roof-glass of a stove; another plant flowered simultaneously in a stove at Kew. Old plants rarely flower freely, but from the pendent habit assumed by

November, 1910.

their branches, which give off small adventitious roots at the nodes, they form effective basket-plants, and bear a considerable resemblance to some of the tropical species of *Aeschynanthus* not only in this respect, but in the character of the foliage and in the aspect of the flowers. It would appear, however, from the account given by Oersted, that under natural conditions this species has a woody stem which gives off long straight spreading branches without adventitious roots.

DESCRIPTION.—*Undershrub* or *herb*, epiphytic; stem woody, somewhat 4-angled, rather tawny, glabrous, freely branched; branches simple, sparingly adpressed pubescent upwards, with internodes 5–9 lin. long, in a wild state, according to Oersted, strict and spreading or upraised, in cultivated plants flexuous and pendent. *Leaves* opposite, shortly petioled, wide ovate or ovate-oblong, acute or subacute, base obtuse or rounded, 5–8 lin. long, 3–5 lin. wide, fleshy, convex and deep green, shining and glabrous above, beneath pale green, and very finely adpressed puberulous; lateral nerves 3–4 on each side, very oblique, distinct beneath; petiole 1–1½ lin. long. *Flowers* axillary, solitary, erect, their peduncles about 5 lin. long. *Sepals* erect, much imbricate, ovate, caudate-acuminate, repandly toothed below, about 8 lin. long, 4 lin. wide, adpressed puberulous outside. *Corolla* pink, nearly 3 in. long, bilabiate, sparingly villous with jointed hairs externally; tube narrow, slightly widened towards the throat, 1½–1¾ in. long, somewhat gibbous at the base behind; upper lip galeate with a rounded or slightly cuspidate tip; lateral lobes spreading, triangular, connate for some distance with the upper lip; lower lip reflexed, linear-lanceolate, about 9 lin. long. *Stamens* 4, exserted; filaments glabrous; anthers cohering. *Disk-gland* solitary, posticous, emarginate. *Ovary* adpressed pubescent; placentas 2-lamellate.

Fig. 1, a pair of leaves; 2, calyx, in vertical section, and pistil; 3, base of a corolla and stamens; 4, a jointed corolla-hair:—*all enlarged.*

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M. S. del. J. N. Fitch lith.

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TAB. 8345.

PYRACANTHA ANGUSTIFOLIA.

South-western China.

ROSACEAE. Tribe POMEAE.

PYRACANTHA, *Roem.*; *C. K. Schneider in Handb. d. Laubholzk.* vol. i. p. 761.

Pyracantha angustifolia, *C. K. Schneider in Handb. d. Laubholzk.* vol. i. p. 761; a *P. coccinea,* Roem. (*Crataegus Pyracantha,* Med.), receptaculo calyceque extus cinereo-tomentoso et foliis lineari-oblongis integris differt.

Frutex divaricato-ramosus, ramulis primo magis minusve ochraceo-tomentosis anno secundo glabratis, cortice fusco-purpureo obtectis, rugoso-lenticellatis, nonnullis in spinas validas 0·5–1·5 cm. longas mutatis. *Folia* in brachycladiis et ad macrocladiorum bases fasciculatim congesta, persistentia, lineari-oblonga, obtusa, mucronulo imposito, basin versus magis minusve attenuata, margine recurvo integra vel hinc inde minutissime glanduloso-serrata, 2–6 cm. longa, 7–9 mm. lata, subcoriacea, supra nisi novella glabra, nitidula, infra griseo-tomentella indumento demum laxo vel fere evanido; nervi laterales tenues, utrinque circiter 8, supra impressi; petioli 3–10 mm. longi. *Corymbuli* pauciflori vel ad 15-flori quam folia breviores; pedunculi pedicellique cinereo-tomentosi. *Receptaculum* turbinatum, cinereo-tomentosum. *Sepala* late ovata, persistenter tomentosa, 1·5 mm. longa. *Petala* alba, suborbicularia. *Stamina* circiter 20. *Carpella* 5; styli 5. *Fructus* depresso-globosus, aurantiacus, glabratus, 6–8 mm. diametro, calyce persistente coronatus; pyrenae dorso inferne receptaculo adnatae caeterum liberae, receptaculo circumvallatae.—*Cotoneaster angustifolia,* Franch. Pl. Delav. p. 221.—O. STAPF.

The Chinese Thorn here figured is very closely allied to the European Everlasting Thorn and to its Himalayan representative the White Thorn of Nepal. A perplexing divergence of view has prevailed as to the taxonomic position and status of these three Thorns. The Everlasting Thorn or Buisson Ardent which, in 1753, Linnaeus named *Mespilus Pyracantha*, was, forty years later, treated by Medik as a *Crataegus* and, after a similar lapse of time, referred by Spach to *Cotoneaster*. The Nepalese White Thorn was in the first instance referred, in 1814, to *Crataegus*, by Roxburgh, as *C. crenulata*, but was treated by D. Don in 1825 as a *Mespilus,* and was only transferred, by Koch, to *Cotoneaster* as recently as 1869. The subject of our illustration, which was discovered by Delavay in Yunnan in 1882, was in the first instance referred by Franchet in 1889 to *Cotoneaster* as *C. angustifolia.* The agnomen "Pyra-

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cantha" definitely associated by Linnaeus with the Buisso Ardent is believed to have been misapplied; it is generally held that the Pyracantha of Greek authors is our Hawthorn. Nevertheless the use of the name Pyracantha to connote the Everlasting Thorn has become popular; that plant is now, and bids fair to remain, the Pyracantha of gardens, which fails to appeal to the lay mind either as a *Crataegus* or as a *Cotoneaster*. In this case the popular instinct appears to be sound, for the suggestions made by Medik and by Spach, though more satisfactory than that of Linnaeus, are both more or less open to objection. Under the circumstances it seems desirable, and it certainly is more convenient, to adopt yet another suggestion, first made by Roemer in 1847, and recently endorsed by Schneider, and to treat the group of species to which our plant belongs as a genus *Pyracantha*, closely allied indeed both to *Crataegus* and to *Cotoneaster*, but equally distinct from either. *Pyracantha angustifolia* was first introduced to cultivation by Mr. M. L. de Vilmorin from seeds sent to Les Barres from Eastern Tibet by Soulié in 1895. A second set of plants was raised at Kew from seeds sent from Western China in 1899 by Lieut. Jones. The original plant at Les Barres bears plentiful crops of berries which in the late autumn develop a bright orange colour. At Kew, where *P. angustifolia* does well on a sunny wall, there is hardly sufficient sunshine to bring out its best qualities as a shrub, and in the open, although it survives the winter, it has not proved perfectly hardy. In the warmer conditions of South-western England it is more at home, and the material for an illustration has been obtained from a plant in fruit in the open in January, 1910, in the garden of Lieut.-Col. D. D. Cunningham at Tormount, Torquay; the flowering twig which completes our figure was supplied in July, 1910, from the same bush. The species is best propagated from cuttings of half ripened wood.

DESCRIPTION.—*Shrub*; branches spreading; twigs at first more or less yellow tomentose, in their second season glabrous, their bark tawny purple, rough with lenticels; occasionally some of the twigs modified into stout spines 3–8 lin. long. *Leaves* clustered on abbreviated twigs or at the bases of longer ones, persistent, linear-oblong, obtuse with a slight mucro, more or less narrowed to the base, margin recurved, entire or here and there faintly glandular serrate, $\frac{3}{4}$–$2\frac{1}{4}$ in. long, 4–5 lin. wide, subcoriaceous, glabrous above except when young and somewhat polished, beneath clothed with a grey tomentum which becomes lax and almost disappears with age; lateral nerves slender, about 8 on each side, impressed above; petioles 2–5 lin. long. *Corymbs* rather few-flowered, shorter than the leaves; peduncles and pedicels grey pubescent. *Receptacle* turbinate, grey pubescent. *Sepals* wide ovate, persistently pubescent, 8 lin. long. *Petals* white, suborbicular. *Stamens* about 20. *Carpels* and styles 5. *Fruit* depressed-globose, orange-yellow, glabrate, 3–4 lin. long, tipped by the persistent calyx lobes; pyrenes adnate dorsally in their lower portion to the receptacle, otherwise free from though surrounded by the receptacle.

Fig. 1, part of a leaf; 2, a flower; 3, calyx, partly removed, showing stamens and pistil; 4, a carpel; 5, fruit in vertical section, showing pyrenes; 6, a pyrene; 7, the same in vertical section; 8, seed:—*all enlarged.*

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[illegible]

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TAB. 8346.

HOULLETIA SANDERI.

Peru.

ORCHIDACEAE. Tribe VANDEAE.

HOULLETIA, *A. Brongn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 550; *Pfitzer in Engl. & Prantl Nat. Pflanzenf.* vol. ii. pars 6, p. 168.

Houlletia Sanderi, *Rolfe in Gard. Chron.* 1910, vol. xlvii. p. 206; *Orch. Rev.* 1910, p. 118; species *H. Lowianae*, Reichb. f. proxima, sed labelli lobis lateralibus falcato-oblongis et obtusis nec longe acuminatis distincta.

Herba epiphytica. *Pseudobulbi* conferti, ovoideo-oblongi, sulcati, 5–7 cm. longi, circiter 2 cm. lati, monophylli. *Folia* breviter petiolata, oblongo-lanceolata, acuta, subplicata, recurva, circiter 30 cm. longa, 4 cm. lata. *Scapus* erectus, 25–30 cm. alta, vaginis lanceolatis acutis obtectus, 2–3-florus. *Bracteae* lanceolatae, breviter acuminatae, nigro-punctatae, circiter 1·5 cm. longae. *Pedicelli* 3–4 cm. longi. *Flores* magni, straminei, inversi. *Sepala* subpatentia, valde concava, posticum late ellipticum, apiculatum, circiter 3 cm. longum; lateralia late ovata, apiculata, circiter 3 cm. longa. *Petala* suborbicularia, subconcava, circiter 3 cm. longa. *Labellum* profunde trilobum; lobi laterales late falcato-oblongi, apice obtusi vel rotundati et leviter recurvi, 1·5 cm. longi, medio transverse carinati, fronte in dente obtuso extensi; mesochilium oblongum, truncatum, 1 cm. longum, carnosum; epichilium obovato-oblongum, 1·5 cm. longum, apice denticulatum, basi cuneatum, submembranaceum. *Columna* clavata, arcuata, circiter 1·8 cm. longum; pollinia 2, cerea, ovoidea; stipes lineari-oblongus; glandula suborbicularis.—R. A. ROLFE.

Three members of the South American genus *Houlletia* have already been figured in this work: *H. Brocklehurstiana*, Lindl., a native of Brazil, at t. 4072; *H. picta*, Linden and Reichb. f., a native of Colombia, at t. 6305; and *H. Landsbergi*, Linden and Reichb. f., another Brazilian species, at t. 7362. The interesting species now depicted was imported from Peru by Messrs. Sander & Sons, St. Albans; there is an example of the species in the orchid collection at Kew. *H. Sanderi* flowered for the first time in Europe in January, 1910, in the nursery of Messrs. Sander & Sons at Bruges; our plate has been prepared from the specimen then sent to Kew for determination. It is most nearly allied to *H. Lowiana*, Reichb. f., another Colombian species, but differs considerably in the details of the lip, more especially in the very dissimilar side lobes. The Kew plant, which has not

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yet flowered, thrives well under the treatment suitable for *Lycaste Skinneri*, Lindl., an orchid which is figured at t. 4445 of this work.

DESCRIPTION.—*Herb*; pseudobulbs close set, ovoid-oblong, furrowed, 2–2½ in. long, about ¾ in. thick, unifoliate. *Leaves* shortly petioled, oblong-lanceolate, acute, slightly plicate, recurved, about 12 in. long, 1½ in. wide. *Scape* erect, 10–12 in. long, 2–3-flowered, clothed with lanceolate acute sheaths; bracts lanceolate, shortly acuminate, black dotted, about 8 lin. long; pedicels 1¼–1½ in. long. *Flowers* large, pale yellow, inverted. *Sepals* somewhat spreading, very concave, apiculate, about 1¼ in. long, the posterior wide elliptic, the lateral pair wide ovate. *Petals* nearly orbicular, somewhat concave, about 1¼ in. long. *Lip* deeply 3-lobed; lateral lobes widely falcate-oblong, obtuse or rounded and slightly recurved at the tip, 8 lin. long, transversely keeled in the middle and prolonged in front in an obtuse tooth; mesochile oblong, truncate, 5 lin. long, fleshy; epichile obovate-oblong, 8 lin. long, with denticulate tip and cuneate base, nearly membranous. *Column* clavate, curved, about 9 lin. long; pollinia 2, ovoid, waxy; stalk linear-oblong; gland suborbicular.

Fig. 1, lip and column; 2, column seen from in front; 3, pollinia:—*all enlarged.*

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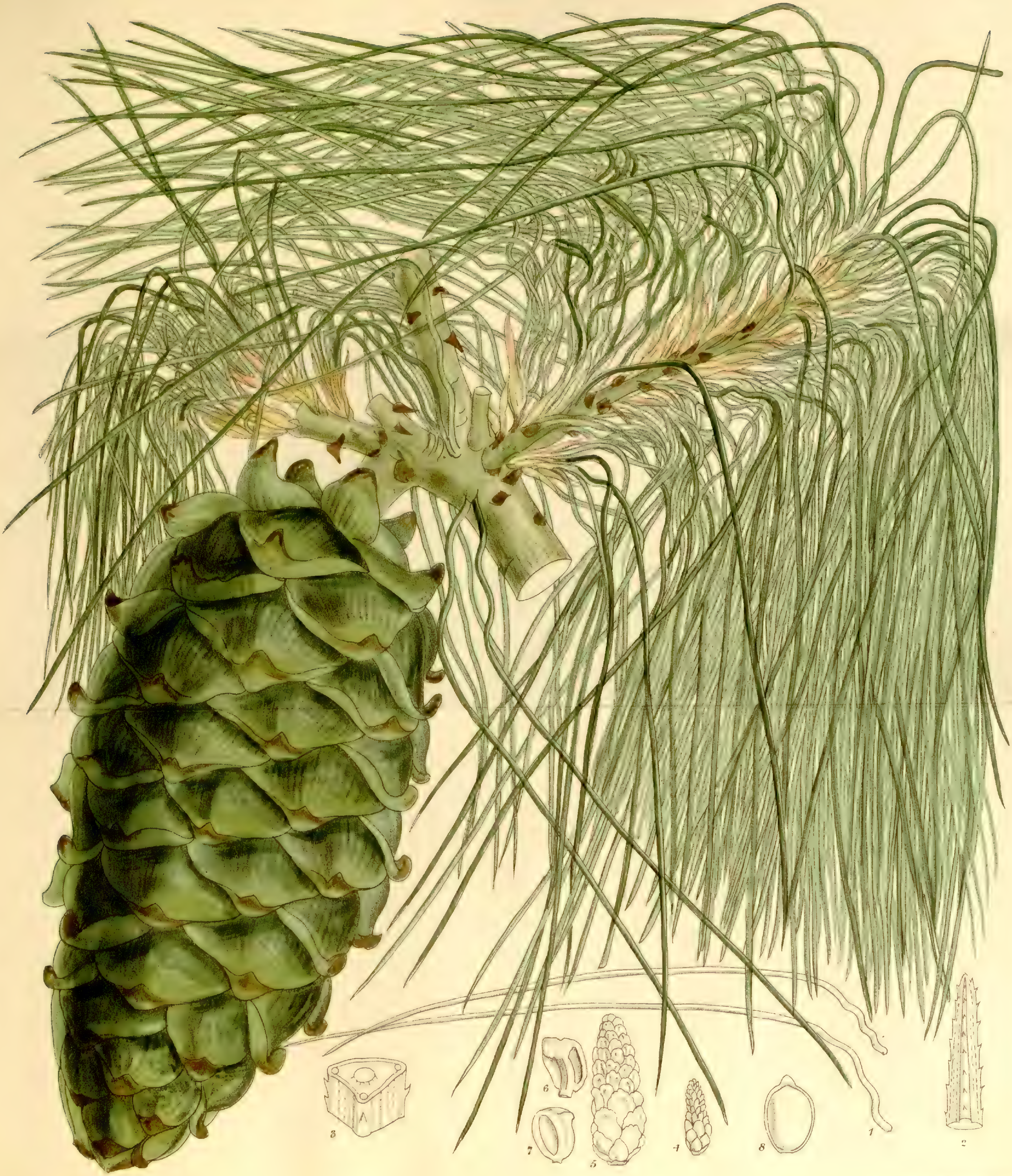

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TAB. 8347.

PINUS ARMANDII.

South-western China.

CONIFERAE. Tribe ABIETINEAE.

PINUS, *Linn.*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 483.

Pinus Armandii, *Franch. in Pl. David.* vol. i. p. 285, t. 12, et *in Journ. de Bot.* vol. xiii. p. 254; *Beissner in Nuov. Giorn. Bot. Ital.* n. s. vol. iv. p. 184, t. 5, fig. 2; *Mast. in Journ. Linn. Soc.* vol. xxvi. p. 549 et vol. xxxv. p. 582, *in Gard. Chron.* 1903, vol. xxxiii. p. 66, figs. 30, 31, et *in Journ. Bot.* vol. xli. p. 269, ex parte; *Diels, Fl. Centr. China*, p. 216; *Henry in Elwes & Henry, Trees of Gt. Brit. & Irel.* pars v. p. 1043; species *P. koraiensi*, Sieb. et Zucc., affinis sed ramulis cinereis glabris vel sub lente sparse pilosis, foliis tenuioribus, strobilorum squamis apice haud vel vix reflexis, seminibus circumcirca argute marginatis distincta.

Arbor ad 18 m. alta, cortice laevi viridescente tecta. *Gemmae* lanceolatae vel cylindricae, pallidae, vix resinosae, squamis mox deciduis. *Ramuli* novelli laeves, glabri vel pilis sparsis minutis parce conspersi, deinde cinerascentes. *Folia* quinatim fasciculata, tenuia, obtusiuscula, minute serrulata, 10–15 cm. longa, vix 1 mm. lata, sectione transversa triangularia, superne viridia, infra utrinque vitta albida notata. *Amenta* mascula aggregata, cylindrica, lutea, ad 1·5 cm. longa, basi squamis late obovatis tenuiter scariosis superne hyalino-marginatis suffulta. *Strobili* subterminales, penduli vel patuli, pedunculo 2–2·5 cm. longo valido suffulti, elongato-ovoidei vel cylindrici, obtusi, 10–17·5 cm. longi, 5–7·5 cm. diametro; squamae rigidae, lignosae, rhombicae, ad 3·5 cm. longae, 3 cm. latae, parte tecta rubescente, parte exposita viridi vel demum olivacea, apice incrassato vix vel brevissime recurvato. *Semen* ellipsoideum, paululo a dorso compressum, 12–15 mm. longum, 10 mm. latum, circumcirca acute marginatum, margine saepe apice producto, pallide fuscescens.—*P. Armandii* var. *Mastersiana*, Hayata in Journ. Coll. Sc. Tokyo, vol. xxv. p. 216, fig. 8. *P. quinquefolia*, David, Voy. China, vol. i. p. 192, *et* Nouv. Arch. Mus. vol. vii. p. 95. *P. scipioniformis*, Mast. in Bull. Herb. Boiss. vol. vi. p. 270. *P. koraiensis*, Mast. in Gard. Chron. 1903, vol. xxxiii. p. 34, figs. 18, 19; in Journ. Bot. vol. xli. p. 269, ex parte, *et* in Journ. Linn. Soc. vol. xxxv. p. 582, ex parte; Beissner in Bull. Soc. Bot. Ital. 1899, p. 310; nec Sieb. et Zucc. *P. Mastersiana*, Hayata in Gard. Chron. 1908, vol. xliii. p. 194.—O. STAPF.

The interesting Pine here figured has much the general aspect of the Himalayan *P. excelsa*, Wall., often known as the Bhutan Pine, or of the Mexican *P. Ayacahuite*, Ehrenb., the Hickory Pine; the cones are, however, very unlike those of the two species mentioned. The species is most nearly allied to the Corean Pine, *P. koraiensis*, Sieb. &

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Zucc., with which it has to some extent been confounded. The material from which our illustration has mainly been prepared was derived from one of a group of young trees raised from seed transmitted to Kew in 1897 by Mr. A. Henry, who had collected it at Mengtze, in Yunnan. These trees, which are now from 10–15 feet high, and are growing very freely, are probably the finest in Europe. Whilst several of them have borne cones, no male inflorescence has yet been produced, and the seeds are consequently infertile. The figures of the male flowers, male spikelets and seed here given have been prepared from an authentic specimen of the plant preserved in the herbarium at Kew. The cones of *P. Armandii*, which promises to be one of the most ornamental of the pines of the 5-leaved group, vary consideraby in size, the largest being 7 in. long and 3–3½ in. wide.

DESCRIPTION.—*Tree*, reaching 60 ft. in height, bark smooth, greenish. *Buds* lanceolate or cylindric, pale and hardly resinous, their scales quickly deciduous. *Twigs* smooth, glabrous or sparingly beset with small scattered hairs, at length ash grey. *Leaves* in tufts of five, slender, somewhat blunt, very finely serrulate, 4–6 in. long, under ½ lin. wide, triangular in section, green above, beneath with a whitish line along each side of the midrib. *Male catkins* clustered, cylindric, yellow, reaching 8 lin. in length, clothed at the base with wide obovate scales thinly scarious upwards and with hyaline edges. *Cones* subterminal, pendent or spreading, their peduncles ¾–1 in. long, elongate-ovoid or cylindric, obtuse, 4–7 in. long, 2–3 in. wide; scales rigid, woody, rhomboid, 1½ in. long, 1¼ in. wide, the hidden lower portion reddish, the exposed upper part green or at length olive-green, the tip thickened and hardly if at all recurved. *Seed* ellipsoid, somewhat dorsally compressed, 6–7 lin. long, 5 lin. wide, of a pale tawny colour and with a sharp circumferential edge which is often somewhat produced at the tip.

Fig. 1, leaves; 2, tip of a leaf; 3, leaf in transverse section; 4 and 5, male inflorescence; 6 and 7, male flowers; 8, seed:—1, 4 *and* 8 *of natural size, the rest enlarged.*

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TAB. 8348.

NEOGLAZIOVIA CONCOLOR.

Brazil.

BROMELIACEAE. Tribe BILLBERGIEAE.

NEOGLAZIOVIA, *Mez in Mart. Flor. Bras.* vol. iii. pars 3, pp. 180, 426; *Engl. & Prantl, Nat. Pflanzenf. Nachtr.* i. p. 66.

Neoglaziovia concolor, *C. H. Wright*; species *N. variegatae*, Mez, affinis sed foliis uniformiter albo-lepidotis distincta.

Herba, caulis abbreviatus. *Folia* 5–8, linearia, acuminata, basi crassa vaginata, rigida, albo-lepidota, 40–60 cm. longa, 2·5 cm. lata; spinae inter se 1–1·5 cm. distantes, 4 mm. longae, basi compressae, subulatae, incurvae vel rarius rectae, aliquando parte foliorum suprema obsoletae. *Racemus* terminalis, quam folia brevior; pedunculus albo-floccosus; bracteae lanceolatae, albo-floccosae, infima 10 cm. longa, superiores gradatim minores; pedicelli 5 mm. longi, patentes. *Calyx* cinnabarinus, ovoideus, glaber, 1·5 cm. longus; lobi breves, obtusi. *Petala* violacea, oblongo-spathulata, obtusa, 2 cm. longa; squamae basilares 2 mm. longae, laceratae. *Staminum* filamenta 1·7 cm. longa, crassa; antherae dorsifixae, ovales, albae, 2 mm. longae; pollinis granulae ellipticae, longitudinaliter 1-sulcatae, eporosae. *Ovarium* inferum, ovulis in loculis paucis; stylus staminibus aequilongus, ramis 3 brevibus spiraliter contortis instructus.—C. H. WRIGHT.

The Bromeliad here figured is a native of the northern portion of the State of Bahia in Brazil, where it is known as the Makimbeira; here it grows in association with the Caroá, a very nearly allied plant referred by Baker to the genus *Dyckia* as *D. Glaziovii*, but treated by Mez, perhaps more satisfactorily, as the type of a distinct genus *Neoglaziovia*. From the Caroá (*N. variegata*) the Makimbeira (*N. concolor*) differs in its shorter stature and in having its leaves uniformly white-lepidote, the younger parts are indeed almost woolly; the leaves of *N. variegata* are glabrous or only very minutely lepidote, and when fresh are conspicuously marked with lighter transverse bars which in dried specimens become obscure or disappear entirely. The leaves of both species furnish fibre; that of the Caroá is well known and comes chiefly from the Queimadas District; it is made into ropes for binding

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packages of tobacco. These ropes have a breaking strain of 3 tons to the square inch; they are, however, very sensitive to attack by alkalis. The fibre of the Makimbeira is less well known and is of a softer and poorer quality; attention to this fibre and to the plant itself was first called in 1902 by His Majesty's Consul at Bahia in a letter to the Imperial Institute. In 1903 living plants of the Caroá and the Makimbeira were received at Kew from the Imperial Institute; the latter, which flowered for the first time in a tropical greenhouse in September, 1909, provided the material for the figure now given. *N. concolor* has proved, as compared with Bromeliads generally, to be of very slow growth under the artificial conditions of a tropical collection; possibly under natural conditions it may thrive more luxuriantly. At Kew it is planted in a pot in peaty soil and kept in a warm moist house where it receives shade from bright sunshine.

Description.—*Herb*; stem very short. *Leaves* 5–8, linear, acuminate, thick and sheathing at the base, firm, white-lepidote, $1\frac{1}{2}$–2 ft. long, 1 in. wide; spines 5–8 lin. apart, 2 lin. long, flattened at the base, subulate, incurved or occasionally straight, at times absent towards the apex of the leaf. *Raceme* terminal, shorter than the leaves; peduncle white-woolly; bracts lanceolate, white-woolly, the lowest 4 in. long, gradually decreasing in size upwards; pedicels under $\frac{1}{4}$ in. long, spreading. *Calyx* scarlet, ovoid, smooth, over $\frac{1}{2}$ in. long; lobes short, blunt. *Petals* violet, oblong-spathulate, blunt, $\frac{3}{4}$ in. long; basal scales 1 lin. long, lacerate. *Stamens* nearly as long as petals; filaments stout; anthers dorsifixed, oval, white, 1 lin. long; pollen-grains elliptic, with a single longitudinal groove and without pores. *Ovary* inferior; cells few-ovuled; style as long as the stamens, with three short spirally twisted stigmatic arms.

Fig. 1, vertical section of flower with inner perianth segments and stamens removed; 2, an inner perianth segment; 3 and 4, anthers; 5, style-arms; 6, ovules; 7, sketch of an entire plant:—*all enlarged except* 7, *which is much reduced.*

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Tab. 8349.

CORYLOPSIS Veitchiana.

Central China.

Hamamelidaceae.

Corylopsis, *Sieb. et Zucc.*; *Benth. et Hook. f. Gen. Plant.* vol. i. p. 667.

Corylopsis Veitchiana, *Bean*; inter species hucusque descriptas *C. sinensi*, Hemsl., et *C. Henryi*, Hemsl., proxima ab illa tamen foliis maturis glaberrimis staminibusque plane exsertis, ab hac calycis lobis tubo brevioribus, petalis latioribus, staminibus exsertis, nectariis calycis lobos excedentibus apte distinguenda.

Frutex 2-metralis comam fere sphaericam compactam efficiens; ramuli etiam juniores glabri, rubescentes. *Folia* breve petiolata, elliptica, abrupte breve acuminata vel acuta, mucronulata, basi subcordata, 7–10 cm. longa, 4–5 cm. lata, primum purpurascentia et subtus secus nervos pilis perpaucis simplicibus cito caducis vestita, mox glaberrima supra saturate viridia subtus glaucescentia vel glauca, coriacea; venae primariae utrinque 6–7 parallelae, vena ima nervos 4–5 versus laminae marginem emittente, omnes subtus elevatae in dentes setaceos excurrentes; petiolus 6 mm. longus, glaberrimus. *Ramuli floriferi* cernui, spicati, bracteati, 2·5–5 cm. longi, 1·7 cm. lati, ex axillis foliorum delapsorum orti, 10–15-flori; rhachis pilosa, basi perulis paucis vacuis obsita. *Bracteae stipulares* 2–4, concavae, plus minusve translucentes, pallide viridi-flavi, orbiculares, extra glabrae, margine ciliatae, intus sericeae; bracteae floriferae similes nisi minores et extra intusque hirsutae. *Calyx* viridi-flavus, hirsutus; lobi 5, rotundati, ciliati, tubo triplo breviores. *Petala* 5, primulina, spathulato-orbicularia, lamina 4 mm. lata in unguem 3 mm. longum attenuata. *Stamina* 5; antherae brunneo-rubrae distincte exsertae. *Nectaria* 5, argute 2-dentata, calycis lobos parum excedentia. *Styli* erecti, apice recurvi. *Capsula* ignota. —W. J. Bean.

The Hamamelidaceous genus *Corylopsis* is rather widely distributed throughout Eastern Asia from the Eastern Himalaya to Japan. So far thirteen species have been reported; of these four seem confined to Southern Japan and six occur in Eastern and Central China, only one of these, *C. sinensis*, Hemsl., extending from Kiang-si, through Hupeh, as far as Szechuan in Western China. In the western portion of the region occupied by the genus the species seem less numerous, one only having been collected in Bhutan, another in the Khasia Hills and a third in Manipur. The species here figured was collected at

December, 1910.

Chang-yang in Western Hupeh by Mr. E. H. Wilson in May, 1900, when seeds were sent to Messrs. J. Veitch & Sons, growing in the same general region as *C. sinensis*, to which and to *C. Henryi*, Hemsl., another species from Hupeh, it is most nearly allied. From *C. sinensis* our plant is, however, readily distinguished by its leaves which when mature are quite glabrous, by its distinctly exserted stamens and by its red-brown not yellow anthers; from *C. Henryi* it differs by having more rounded petals and very much shorter calyx-lobes. The flowering spike of *Corylopsis* is the termination of a young ultimately leafy branch. The empty basal protective scales do not, as is the rule, fall away when the buds open; above these scales are a few bracts of stipular nature in association with one or more of which leaves are produced; above these again come the true floral bracts, each with a sessile axillary flower and lateral bracteoles. The true character of the inflorescence is evident by the time the seeds are ripe, for the leaf-bearing base of the axis has by then become woody. The plant from which our figure has been prepared was raised by Messrs. Veitch in their nursery at Coombe Wood, where it has flowered regularly in April for some years past, and is then decidedly attractive owing to the soft primrose-yellow colour and the pleasing fragrance of its blossoms. It appears to be quite hardy; it grows well in an open sandy loam and can be propagated by cuttings.

Description.—*Shrub*; 5–6 ft. high, of bushy rounded habit; branches reddish when young, glabrous. *Leaves* shortly petioled, elliptic, suddenly shortly acuminate or acute and mucronulate, somewhat cordate at the base, 3–4 in. long, 1¾–2 in. wide, reddish-purple and sparingly silky hairy on the nerves beneath when young, becoming dark green above, more or less glaucous and perfectly glabrous beneath when full grown, coriaceous; main veins 6–7 on each side, straight and parallel, the lowest pair giving off 4–5 strong nerves outwards; veins all prominent beneath and extending beyond the margin in setaceous teeth; petiole glabrous, about ¼ in. long. *Flowering branches* spicate, nodding, bracteate, 1–2 in. long, ¾ in. wide, lateral on the naked wood of the previous year, 10–15-flowered; main-axis pilose and beset at the base with a few empty membranous scales; stipular bracts 2–4, concave, semi-translucent, pale yellowish-green, orbicular, $\frac{3}{8}$ in. in diameter, glabrous outside, ciliate, silky within; floral bracts similar in colour and shape but smaller and hairy on both sides. *Calyx* greenish-yellow, hairy, with 5 ciliate rounded lobes about one-third the depth of the tube. *Petals* 5, primrose-yellow, spathulate orbicular, $\frac{1}{5}$ in. wide, narrowed to a claw about $\frac{1}{6}$ in. long. *Stamens* 5, the red-brown anthers distinctly exserted. *Nectaries* 5, sharply 2-dentate, somewhat longer than the calyx-lobes. *Capsule* not seen.

Fig. 1, flower and bracts; 2, petal; 3, stamens and pistil; 4, staminode; 5, stamen; 6, vertical section of pistil:—*all enlarged.*

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Tab. 8350.

JACOBINIA SUBERECTA.

Uruguay.

Acanthaceae. Tribe Justicieae.

Jacobinia, *Moric.*; *Benth. et Hook. f. Gen. Plant.* vol. ii. p. 1114.

Jacobinia suberecta, *André in Rev. Hortic.* 1900, p. 210 cum ic.; species *J. stellatae*, Robins. & Greenm., affinis sed habitu prostrato foliis minoribus obtusioribus pilisque simplicibus nec stellatis velutinis facillime distinguenda.

Herba, molliter velutino-tomentosa. *Caules* elongati, prostrati, ramis floriferis erectis. *Folia* petiolata, opposita, patula, crasse herbacea, ovata, obtusa, basi rotundata vel cuneato-rotundata, 2–7 cm. longa, 1–3·5 cm. lata; petiolus 1–3·5 cm. longus. *Cymae* pedunculatae, parvae, 5–10-florae vel abortu 1-florae; bracteae spathulato-obovatae, obtusae, 8–9 mm. longae, 3–4 mm. latae; bracteolae lineari-lanceolatae, acuminatae, pubescentes et ciliatae, 4–6 mm. longae; flores sessiles. *Calycis* tubus 1·5–2 mm. longus, subhemisphaericus; lobi 3–4 mm. longi, lanceolato-attenuati, acutissimi, extra glabri, intus pilis minutissimis conspersi, subciliati. *Corolla* bilabiata, extra pubescens, intus glabra, laete coccinea; tubus 3·5 cm. longus, leviter curvatus, inferne gracilis, superne ampliatus, fauce 5–6 mm. diametro; labium superius 1 cm. longum, ovatum, apice minute emarginatum; labium inferius 1 cm. longum, oblongum, apice subtruncatum, 3-dentatum. *Stamina* 2, corollae subaequilonga, medio tubo inserta; filamenta pubescentia; antherae loculis oblongis uno paullo altius affixo. *Discus* percrassus, cupularis, lutescens. *Ovarium* apice minute pubescens; stylus filiformis, glaber, stigmate minutissime 2-lobo.—N. E. Brown.

The attractive *Jacobinia* here figured is a native of Uruguay, whence it was introduced into cultivation in 1899 by Mr. J. Sallier of Neuilly-sur-Seine. The habit of the plant is unusual in the genus, for most of the species of *Jacobinia* have erect stems; in *J. suberecta*, however, the stems are prostrate and form a compact mass which gives off a number of erect flowering branches. This characteristic renders it a very suitable plant for culture in a hanging basket. A pleasing grey-green effect is produced by the velvety pubescence which clothes the leaves and stems, to which the bright scarlet flowers afford a striking contrast. The material from which our figure has been prepared was presented by Col. R. H. Beddome, who successfully flowered

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it in his stove collection at West Hill, Putney, in July, 1909. Col. Beddome informs us that this *Jacobinia* does not flower with him when grown as a large plant under ordinary stove conditions. But young succulent cuttings, rooted in the spring in the propagating frame, planted in small pots in a mixture of leaf-mould, loam, sand and pea-shaped crocks, and slightly fed with fertilizer, have flowered freely in his collection when kept on shelves quite close to the glass.

DESCRIPTION.—*Herb*; uniformly softly velvety pubescent; stems long and prostrate; flowering branches erect. *Leaves* petioled, opposite, ovate, obtuse, base rounded or cuneately rounded, $\frac{3}{4}$–$2\frac{1}{2}$ in. long, $\frac{1}{3}$–$1\frac{1}{4}$ in. wide; petiole $\frac{1}{3}$–$1\frac{1}{4}$ in. long. *Cymes* peduncled, small, 5–10-flowered or by suppression 1-flowered; bracts spathulate-obovate, obtuse, about $\frac{1}{3}$ in. long, $\frac{1}{6}$ in. wide; bracteoles linear-lanceolate, acuminate, pubescent and ciliate, 2–3 lin. long; flowers sessile. *Calyx* tube about 1 lin. long, nearly hemispheric; lobes about 2 lin. long, narrowly lanceolate, very acute, glabrous outside, subciliate, clothed within with minute hairs. *Corolla* 2-lipped, pubescent outside, glabrous within, bright scarlet; tube $1\frac{1}{4}$ in. long, slightly curved, slender below, widened upwards and about $\frac{1}{4}$ in. across at the top; upper lip 5 lin. long, ovate, slightly emarginate; lower lip 5 lin. long, oblong, subtruncately 3-toothed. *Stamens* 2, about as long as the corolla, adnate to the middle of the tube; filaments pubescent; anther cells oblong, one situated higher than the other. *Disk* very thick, cup-shaped, yellowish. *Ovary* slightly pubescent at the apex; style filiform, glabrous; stigma minutely 2-lobed.

Fig. 1, flowering cyme, with corolla removed; 2, calyx and base of style; 3, calyx, partly removed, to show disk and ovary; 4, stamens, with portion of corolla-tube:—*all enlarged.*

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TAB. 8351.

DENDROBIUM SANDERAE.

South-eastern Asia.

ORCHIDACEAE. Tribe EPIDENDREAE.

DENDROBIUM, *Swartz*; *Benth. et Hook. f. Gen. Plant.* vol. iii. p. 498.

Dendrobium Sanderae, *Rolfe in Gard. Chron.* 1909, vol. xlv. p. 374, fig. 163; *Orch. Rev.* 1909, p. 209, fig. 17; a *D. Dearei,* Reichb. f., floribus majoribus et labelli basi lobisque lateralibus purpureo-striatis differt.

Herba epiphytica, erecta. *Caules* elongati, infra medium paullo incrassati, 40–80 cm. alti, striati, dense foliati, internodi 2–2·5 cm. distantes. *Folia* oblonga vel elliptico-oblonga, acuta vel minute biloba, 4–5 cm. longa, circiter 1–1·5 cm. lata. *Racemi* laterales, prope apicem ramorum producti, 1·5–2·5 cm. longi, 3–4-flori, basi vaginis ochreatis brevibus obtecti. *Bracteae* late ovato-oblongi, subacuti, membranacei, 2–3 mm. longi. *Pedicelli* circiter 4 cm. longi, teretes. *Flores* magni, albi, labelli disco et lobis lateralibus purpureo-striatis. *Sepalum* posticum lanceolatum, acutum vel acuminatum, carinatum circiter 3·5 cm. longum; sepala lateralia oblongo-lanceolata, acuta vel acuminata, carinata, circiter 4 cm. longa, basi obliqua in mentum conicum acuminatum 2 cm. longum producta. *Labellum* trilobum, 4 cm. longum; lobi laterales rotundati vel subtruncati, 1 cm. lati; lobus intermedius obovatus, truncatus vel obtuse bilobus, crenulatus, 2–2·5 cm. latus. *Columna* lata.—R. A. ROLFE.

The figure of the striking *Dendrobium* here given has been made from a plant presented to the Kew collection of orchids by Messrs. Sander & Sons, St. Albans. It is most nearly allied to the Philippine *D. Dearei*, Reichb. f., but differs from that species in having larger flowers which, in addition to some minor structural points, are marked by the presence of purple stripes on the side lobes and base of the lip. Introduced to cultivation only in 1909, sufficient time has hardly yet elapsed to admit of a definite judgment as to its cultural requirements. So far it has thriven well at Kew under the treatment that answers for *D. Dearei*; tropical conditions with plenty of water both at the root and overhead while new growths are being formed, and rest in a dry atmosphere afterwards. The imported plants have flowered in October, but it is possible that when the species has become established in this country they may flower in spring.

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DESCRIPTION.—*Herb*; epiphytic, erect; stems elongated, somewhat thickened below the middle, 1½–3 ft. long, striate, closely leafy; internodes ¾–1 in. apart. *Leaves* oblong or elliptic-oblong, acute or very shortly 2-lobed, nearly 2 in. long, 5–8 lin. wide. *Racemes* lateral, produced near the apex of the stems, ¾–1 in. long, 3–4-flowered, clothed at base with short sheaths; bracts wide ovate-oblong, somewhat acute, membranous, 1–1½ lin. long; pedicels about 1¾ in. long, terete. *Flowers* large, white with purple stripes on the disk and the lateral lobes of the lip. *Sepals* white, the upper lanceolate, acute or acuminate, keeled, about 1½ in. long; lateral oblong-lanceolate, acute or acuminate, keeled, about 1¾ in. long, oblique at the base and produced into a conical acuminate mentum ¾ in. long. *Lip* 3-lobed, 1¾ in. long, lateral lobes rounded or almost truncate, 5 lin. wide, central lobe obovate, truncate or obscurely 2-lobed, crenulate, ¾–1 in. wide. *Column* broad.

Fig. 1, column; 2, anther-cap; 3, pollinia; 4, sketch of an entire plant:—*all enlarged except* 4, *which is much reduced.*

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